THE IMPACT OF REGIONAL INTEGRATION ON SOCIO-ECONOMIC DEVELOPMENT IN SOUTHERN AFRICAN CUSTOMS UNION COUNTRIES

by

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Submitted in accordance with the requirements of the degree of

DOCTOR OF PHILOSOPHY

in the subject

ECONOMICS

at the

UNIVERSITY OF SOUTH AFRICA

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DECLARATION

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Title of the Study: The impact of regional integration on socio-economic development in Southern African Customs Union countries.

I declare that the above study is my work and that all the sources that I have used or quoted have been indicated and acknowledged through complete references.

I further declare that I submitted the thesis to originality checking software and that it falls within the accepted requirements of originality.

I further declare that I have not previously submitted this work, or part of it, for examination at UNISA for another qualification or at any other higher education institution.

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30/03/2020

SIGNATURE DATE

KEY TERMS DESCRIBING THE TOPIC OF A THESIS

Title of the thesis: The impact of regional integration on socio-economic development in Southern African Customs Union countries

Key terms: Regional integration; customs union; socio-economic development; SACU; Regional Integration Index; developmental regionalism; developing countries; principal component analysis; model estimation; least squares dummy variable; fixed-effects model; and random-effects model

ACKNOWLEDGEMENTS

To the development and accomplishment of this study, my profound gratitude to the individuals and organisations, without whom it would not have been possible. I want to express my gratitude to the following people:

- Professor Senia Nhamo, my promoter and adviser. I am grateful that you understood my thirst to achieve this dream. Your commitment will never be forgotten. I appreciate the many opportunities, and exposure I gained through this journey because of you. You kindly and professionally guided this study throughout.
- The financial assistance received from the Division Student Funding at the University of South Africa (UNISA) is acknowledged. I am indebted to the SACU secretariat in Windhoek staff, particularly Mr B. Ginindza, Mr D. Ndwandwe and Mr A. Sindano, who assisted me in accessing invaluable information and the statistical databases for SACU countries.
- I express my gratitude to the United Nations Development Economic Planning (UNIDEP); for the training on the African Regional Integration Index implementation and uses. Special thanks go to Ms S. Sufrau and Mr S. Mevel for their continued support towards developing the SRII.
- I am much obliged to Mr K. Kalundu and Dr R. Chifamba from the University of Namibia for assisting me with statistical and econometrics processing. Mrs E. Marx, your professional language editing of this thesis is much appreciated and your tireless efforts towards the accomplishment of this study. Dr E. Woyo, Ms C. Abureni, and Ms S. Edivurge, my friends, your encouragement and support made me strong.
- My appreciation to my copyeditor, Elizabeth Marx, representing Academic and Professional Editing Services (APES) for attending to the copyediting and formatting of my thesis.
- I want to dedicate this work to my dear husband, Edingtone. I am forever indebted to you; your unwavering support, love, and prayers that will be cherished in my heart for years. To my children, Isheanesu, Anotida, and Tinotenda, my greatest wonders, whose smiles and prayers energised me throughout the journey, may the efforts

invested in realising this dream be an encouragement to strive for the best in your lives.

- Above all, the Honour and Glory be unto GOD!

ABSTRACT

Regional integration gained popularity and is prioritised globally, especially in developing economies, including those on the African continent. This is based on its potential to accelerate trade, stimulate economic growth, and increase access to basic necessities and to induce a sustainable increase in economic output and improved standards of living. Regional integration in the context of developing economies is entirely implicit. Modern literature observes it as a policy option for dealing with a wide variety of issues related to politics, economic factors, and societal welfare. The SACU, existing since 1910, made several trade agreements globally. The union aims at reducing inequalities, ensuring continuous improvement in the general welfare of the population, and sustainable economic growth. Research, though, indicates that the region persistently reflects poor socio-economic conditions. This is accompanied by limited development in infrastructure, lowly skilled and experienced workforce. Primary sector activities dominate their economies, such as mining and agriculture, high levels of inequalities and poverty. Regional integration was implemented differently in several countries globally, and Africa in particular. The research noted that literature on regional integration and its implications on socio-economic development lacks, especially in the context of SACU. A deficiency was also emphasised the universal measurement of regional integration, which is not standardised. Some research employed single variables as a proxy, whilst some composite indices were also compiled and implemented, suiting the diverse setups and environments. The development measurements, therefore, cannot universally be applied attributable to context-specific concerns, prevalent in regions or countries. This study developed the SACU Regional Integration Index (SRII) because the existing indices on regional integration are limited concerning applicability. Most of the indices established in the literature were developed for specific countries and regions with diverse characteristics from those of the SACU region. In addition to a detailed literature review and closing methodological divergencies, this study evaluated the effects of regional integration on socio-economic development in the SACU countries. The objectives of the study were first, to produce the SACU Regional Integration Index. Second, the study

aimed at evaluating the effect of regional integration on various socio-economic development factors listed as economic growth, investments, and the Human Development Index (HDI), inequalities and poverty. Third, the study provided policy recommendations to the socio-economic problems encountered by the SACU countries; and lastly, to implement the proposed SRII as a way of providing policymakers with the actual impacts. The study employed the principal component analysis (PCA) to construct the SRII. The Ordinary Least Squares (LSDV), fixed effects and random effects were employed to ascertain the effect of regional integration on socio-economic development in the SACU countries. The constructed SACU index comprises four dimensions. These are trade integration; productive integration; infrastructure integration; and financial and macroeconomic policies integration. The index revealed that SACU countries are dominated by trade and productive integration. Further analysis of the results indicated that collaboration on the financial and macroeconomic policies is lacking and the infrastructure dimension is lagging in the SACU region. Based on the second objective, the results indicate that regional integration is critical in improving trade openness and HDI, especially in Lesotho, Botswana, and Namibia. The effect of regional integration on real Gross Domestic Product (GDP) growth, inequalities, and poverty reduction was realised in the long run through the interaction of all variables under study. This supported the dynamic effects posited by the dynamic theory of regional integration. It was established that growth, though, in infrastructure is insignificant compared to other dimensions of regional integration. This explains why regional integration was unsupportive concerning stimulating investments in all the economies forming the SACU region. The third objective was to proffer policy recommendations. Several practical policy recommendations emerged from this study, based on the literature findings and review. These recommendations include implementing inclusive development programmes, promotion private sector participation in economic activities, and policies, to boost production capacity in the countries in this region. Based on the fourth objective, this study further recommends SACU as a region, to integrate into the global economy. This can be conducted by participating in global production networks for manufacturing and taking advantage of emerging economies. This would diversify their export markets and their

sources of finance development. SACU countries should make regional integration and trade a part of their national and sectoral development plans, ensuring coherent trade and industrial policies. They should also improve their labour, education, social protection, and safety nets. With data availability, this research can be extended to incorporate quarterly data or more years of study. Time-series methods can be applied, such as the Autoregressive Distributive Lag (ARDL) method. This will increase the sample size and the number of observations, which can improve the outcome from the statistical and econometric analysis. Future studies may also evaluate the applicability of the index constructed in this study.

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LIST OF ABBREVIATIONS

AfDB	African Development Bank
ADF	Augmented Dickey-Fuller
ARDL	Autoregressive Distributed Lag
AMU	Arab Maghreb Union
APRII	Asian Pacific Regional Integration Index
ARDL	Autoregressive Distributed Lag
ARII	African Regional Integration Index
AUC	African Union Commission
BRICS	Brazil, Russia, India, China, and South Africa
CEMAC	Central African Economic and Monetary Community
CEN-SAD	Community of Sahel-Saharan States
CM	Common Market
COMESA	Common Market for Eastern and Southern Africa
CU	Customs Union
DBA	Development Bank of Asia
DESTA	Design of Trade Agreements
EAC	East African Community
ECA	Economic Commission for Africa

ECCAS	Economic Community of Central African States
ECGLC	Economic Community of Great Lakes Countries
ECJ	Environmental and Consumer Protection
ECOWAS	Economic Community of West African States
EEA	European Commission Area
EFTA	European Free Trade Association
EMU	Economic Monetary Union
EU	European Union
EURII	European Union Regional Integration Index
FDI	Foreign Direct Investment
FTA	Free trade area
FE	Fixed effects
GAFTA	Greater Arab Free Trade Area
GDP	Gross Domestic Product
GFCF	Gross Fixed Capital Formation
GMM	Gaussian Mixture Model
GNI	Gross National Income
HDI	Human Development Index
HIV/AIDS	Human Immune Virus/ Acquired Immune Deficiency Syndrome

ICT	Information Communication Technologies
IFI	International Financial Integrations
IGAD	Intergovernmental Authority on Development
IMF	International Monetary Fund
IOC	Indian Ocean Commission
LDC	Lowly Developed Countries
LM	Lagrange Multiplier
LSDV	least squares dummy variables
MDG	Millennium Development Goals
MENA	Middle East and Northern Africa
Mercosur	MERcado ComuN Del SUR (Southern Common Market)
NPC	National Planning Commission of Namibia
OECD	Organisation for Economic Co-operation and Development
OLS	ordinary least squares
PCA	Principal Component Analysis
RE	Random Effects
REC	Regional Economic Communities
REI	regional economic integration
RGDP	Real Gross Domestic Product

RI	Regional Integration
RTA	Regional Trade Areas
SA	South Africa
SACU	Southern African Customs Union
SADC	Southern African Development Community
SAPP	Southern African Power Pool
SDG	Sustainable Development Goals
SRII	SACU Regional Integration Index
SSA	Sub-Saharan Africa
TO	Trade openness
TOT	Terms of Trade
UEMOA	Union Economique et Monetarie Ouest Africaine
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Plan
UNECA	United Nations Economic Commission for Africa
UN-ESCWA	United Nations Economic and Social Commission for Western Africa
UNRISD	United Nations Research Institute for Social Development
VECM	Vector Error Correction Model

WAMZ	Western Africa Monetary Zone
WDI	World Bank Development Indicators
WTO	World Trade Organisations

CHAPTER 1: INTRODUCTION

Regional economic integration occurs when the governments of different states or countries in common geographic regions agree on either removing or reducing trade barriers to allow free trading across the region. The trade hindrances that regional integration aims to remove or reduce include tariffs with some non-tariff barriers. The African Development Bank (AfDB 2012) notes that this engagement has vast potential to increase economic growth, poverty alleviation and reducing inequalities between countries. Regional integration is considered beneficial because of accelerated investments and output growth, economies of scale, and reduction in regulatory barriers, which will encourage trade amongst the member states in the same region (Mathews 2003).

The idea of countries converging to trade as a region is increasingly becoming popular and a priority globally (Motelle & Biekpe 2015), and more so, in the economies in Southern Africa (Manwa 2015). This policy was received as a remedy or solution for most emerging most problematic politics, social and economic related issues challenging most developing nations. Other challenges that can also be addressed by regional integration, include slow growth in economic output, increasing lack of basic necessities and high divergences in social classes. This is due to unequal access to opportunities and income, food shortages, and stumpy unemployment levels.

Geda (2009) contends that regional trade in Africa has the potential to increase the population's welfare by promoting development in regional communities. He further emphasised the strength in trade partnerships, especially through the power to negotiate in trade deals and formation of harmonised credible policies in Africa. Hassan (2015) remarks many potential gains could be generated from the free trade agreements, which are likely to stimulate growth all over the world.

Africa has some of the most protracted regional groupings based on the anticipated benefits of increasing economic growth and trade, reducing poverty and spurring sustainable development (Manwa 2015). The history of regional integration dates to the 1950s and 1960s. During this period most of the countries became independent. The Abuja Treaty signed in 1991, accelerated regional economic integration,

attempting to establish the African Economic Community. Ahmed (2016) notes that Africa had around 14 significant regional blocks in 2007. The most recent is the African Continental Free Trade Area (AfCFTA), launched in 2019. AfCFTA, as a recently launched block, focuses on encouraging even more inclusive regional trade across the continent. The challenge of multiple and overlapping memberships of countries to a variety of regional blocks could be hindering the success of their grouping. It, therefore, impedes the potential gains from integrating due to the complexity of political commitments, high transactions costs of trading within their regions, and institutional requirements.

Regional integration processes differ globally and more particularly in Africa, attributable to variances in operating environments, policies, and institutions. The literature review revealed that several studies investigated the influence of this process on the growth of the economy, trade liberalisation, financial markets integration, and development, focusing on inequalities, and poverty alleviation. Previous studies individually assessed these economic, social, commercial, and environmental effects. The commonly established results indicated a positive relationship despite the diverse indicators and methodologies applied by various researchers. Studies on the effect of regional integration on the socio-economic development remain limited, especially from the developing economies perspective.

Manwa (2015) reports that a growing stream of literature focused more on western countries' unions. Inadequate research was conducted in Africa, specifically in the SACU region. The commonly studied African blocks are the Common Market for Eastern and Southern Africa (COMESA), the East African Community (EAC), the Economic Community of West African States (ECOWAS) and the Southern African Development Community (SADC). The SACU region has not been an area of interest despite being one of the oldest blocks. Although South Africa is the second-largest economy in Africa, not much research was conducted regarding regional integration (Manwa & Wijeweera 2016). Basdevant, Benicio and Yakhshilikov (2012) report that research conducted on this subject in the SACU context is dominated by its effect on inequalities. Conclusively, regional integration impacts differ, based on the diverse contexts and scenarios around the countries or block. This explains to researchers that investigations based on the SACU region or individual member states should be

conducted to establish the potential benefits derived from being a member of a regional block. The study, therefore, focused on establishing the effect of regional integration on socio-economic development in the SACU region.

1.1 THE STUDY BACKGROUND

Balassa (1961a) defined regional integration as an initiative by which countries agree to work together towards common economic and political achievements. Other writers in this field, Peiris et al 2015, considered this integrating as an act of uniting towards achieving common objectives. These two definitions conquer that countries pursue regional integration to achieve common goals economically and politically. This would be achieved through abolishing trade barriers and implementing structures and policies that open trade engagements. With such systems in place, free trade will be achieved.

Regional integration provides a platform through which economic policies can be harmonised across all countries in the region. This provides evidence that regional integration can succeed through the formation of common trade areas, the customs unions, common market areas and economic unions. The efforts to converge at various levels to form a sturdy base for successful regional integration.

A hindrance to effective integration in Africa is the overlapping of countries regional blocks (the World Bank 2015). Most African countries' membership overlaps in regional communities within the continent. In the northern part of Africa, AMU shares a communal area with the Great Arab Free Trade Area (GAFTA) and the Sahel-Saharan States (CEN-SAD). The central part of the continent has the three co-existing monetary and economic communities; the Economic Community of Central African States (ECCAS), the Central African Economic and Monetary Community (CEMAC), and Great Lakes Countries (ECGLC) community. On the Southern African side, countries have multiple memberships in SADC, SACU, EAC and COMESA. Masinde and Omolo (2016) commented that this overlapping led to duplication of efforts and is often viewed as wasting the limited resources. Otherwise, avoiding overlapping of membership or becoming one common trade area would benefit the continent at large. Figure 1.1 indicates the overlapping in regional economic arrangements of Africa.

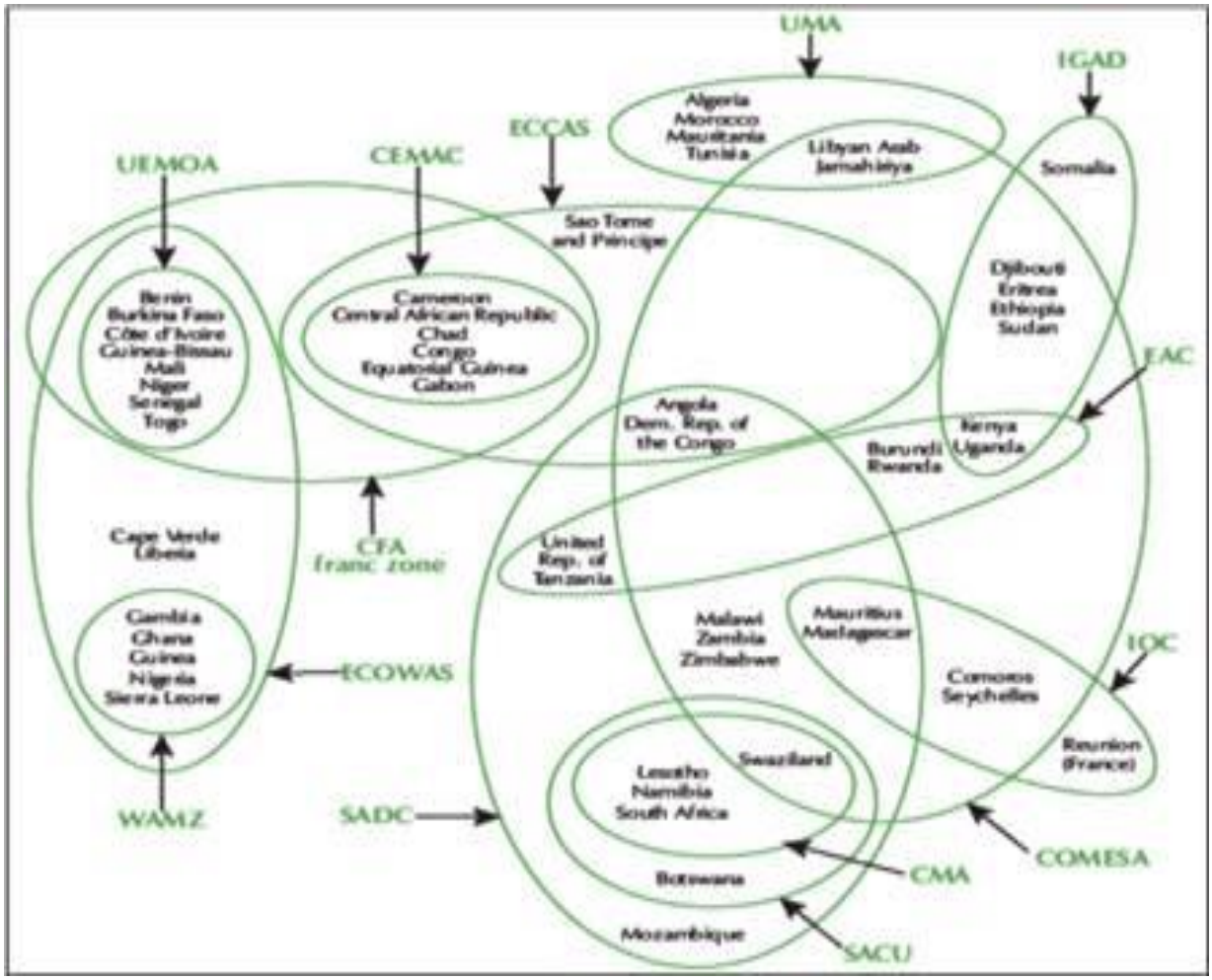

Figure 1.1: The spaghetti bowl of overlapping memberships in African regional economic communities

Source: UNCTAD (2015:6)

The United Nations Conference on Trade and Development (UNCTAD 2015) reports there are 132 regional communities in Africa, indicating that on average each country in Africa belongs to at least two regional communities.

Another hindrance to the success of regional integration in Africa includes weak institutions with limited capacity (Manwa & Wijeweera 2016). The argument towards the zeal to assess the gains from regional integration is the noted continuous increase in poverty, unemployment, food shortages and the growing underground economic activities in most African countries. The question posed will assess whether it is better

for economies to engage in these regional agreements or operate as standalone or belonging to a particular group than multiple as the case in Africa.

1.2 THEORETICAL FOUNDATIONS OF THE STUDY

SACU has been in existence since 1910, making it to be the longest existing block in the continent. In its operations, SACU has a standard tariff applied to countries outside their union and each member has a share allocation from their common revenue pool specified, according to the union agreement. They have common policies, and decisions are coordinated in a union. The WTO (2009) posits that all the other SACU countries lack diversification, except for South Africa. Research indicates that SACU member states heavily depend on South Africa, which is the largest economy amongst them.

The other four countries are dominated by primary sector activities, such as mining and agriculture. They are characterised by slow infrastructure development and low levels of human capacity (Manwa & Wijeweera, 2016). They commented there are different growth rates in the SACU member countries and mostly they do not meet the minimum cut-off for developing economies of 7% recommended in the sustainable development goals (SDGs).

As aforementioned, according to Basdevant et al (2012), SACU member states encounter slow economic growth, persistent poverty and high inequality divergence and food shortages. In contrast to the expectations of CU, SACU countries have dissimilar trade policies (WTO 2009). This raises questions as to whether the absence of harmonised policies in trade could be contributing to the challenges these countries encounter.

1.2.1 The concept of socio-economic development

Socio-economic development, as defined in the business dictionary (2017), is considered as a transformation, leading to a change in the socio-economic conditions due to interaction between complex social, cultural, and physical aspects. Concerning the socio-economic concerns in the socio-economic context, growth can be evidenced through increased social welfare, improved skills and human capacity with increased

employment rates and high levels of income. Chojnicki (2010) contends that the best reflectors of socio-economic development include high economic growth, low unemployment rates, high education levels, a reduced divergence between social classes in society, and improved health conditions monitored through the life expectancy. This study, therefore, complements the analysis of the effect by referring to socio-economic development theories.

1.2.2 The social and economic challenges in SACU

SACU as a region is encountering numerous economic and social challenges. The crucial issues are evidenced in low growth levels of the economies, slow gross capital formation growth. These impose severe problems for the sustainability of companies, trade openness and low levels of human development. Human development examines education, health and standards of living, income inequalities and persistently increasing poverty rates.

1.2.2.1 Economic growth

The growth rate in GDP across the SACU member states can be described as weakly performing. Manwa and Wijeweera (2016) remark that SACU countries' growth performances are uneven and weak compared to the Asian economies, growing at a faster pace. Figure 1.2 indicates that the countries' economic growth declined between 2007 to 2009.

On average, regional economic growth dropped from 5.64% in 2006 was the peak for the region to about -1.044% in 2009 and 0.606% in 2017. All the member states reflect a weaker trend in GDP growth rates, posing concern as to the sustainability and development of the region. The significant decline in economic growth was recorded in 2009 and could have been contributed by the global financial crisis that occurred in 2008/2009.

In 2009, the lowest recorded growth rate was negative. The WTO secretariat Report (2013: 4) reveals that "the lowest consolidated GDP growth rate of -1.7% was recorded in 2009 with countries individually recording the lowest economic growth rates

(negative in Botswana (-7.8%) and South Africa (-1.5%), but positive albeit weak in Namibia (0.6%), Eswatini (1.57%) and Lesotho (2.15%)".

According to the Organisation for Economic Co-operation and Development (OECD) (2015), the global financial crisis is crucially contributed to the fall in demand for minerals. This resulted in a considerable drop in the Botswana economy' growth rates between 2008 and 2009. Subsequently, production dropped by more than 50%, slumped by as much as two-thirds and mines declined in their operations. This is attributable to the diamonds trade on the world market, the world price movements due to the global recession of 2008 that profoundly affected Botswana.

Figure 1.2 reveals that recovery was witnessed starting from 2011. OECD (2015) argued that the economy could recover as expected from the increased global demand in diamonds due to the Euro-zone crisis that caused the fall in demand again. According to the IMF country report for Namibia (2008). The highest productivity and exporting of products were recorded in the mining sector and dominated the aggregate exports in 2004/2005.

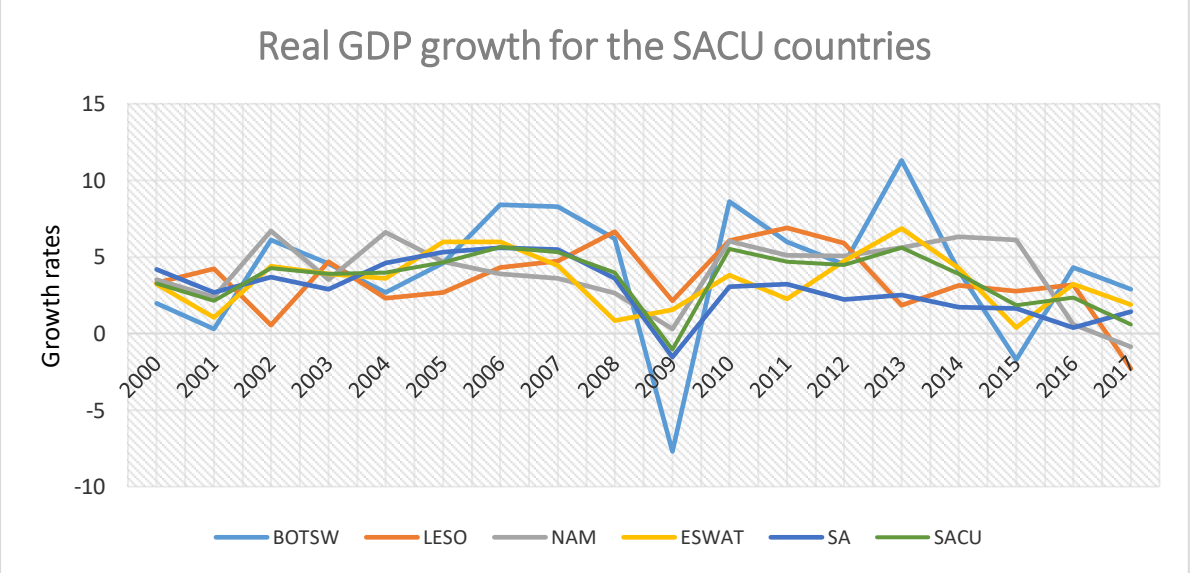

Figure 1.2: Economic Growth for the SACU countries: 2000-2017

Source: Author's compilation based on the SACU statistical database (2018)

Figure 1.2 indicates an excessive sudden fall in the economic output of Lesotho in 2002. This decline is attributed to the base stagnation that followed the 1998-1999 civil

unrest (Libby 2014). The Lesotho economy depends on crop production, which experienced a severe decline during this period. As a result, unemployment levels also increased. Figure 1.2 also indicates that Lesotho had a GDP growth rate of 5.62% in 2013. The aggregate growth rate continued with around 2.5% from 2014 to 2017. This trend also escalated the concerns as to whether regional integration has any positive effect on the GDP growth levels of the SACU economies.

1.2.2.2 Trade

Figure 1.3 presents the trade openness variable measured as a percentage of GDP of the SACU countries since the year 2000. The levels of openness vary across member states, as reflected in Figure 1.3. The trend reveals that the more economically weak the country is, the more it is open to trade. In 2002, Lesotho and Eswatini reached their peak in trade openness. Namibia, South Africa, and Botswana experienced their peak in 2008. According to the World Bank (2015), the net trade in goods and services for SACU countries averaged 10% between 1980 to 2014 as its net trade lessened by 40% during the same period. The World Bank reveals that the three member states before 2004, Lesotho, Namibia and Eswatini's, imports have always been above their exports for the period before 2004. South Africa also recorded a trade deficit in 2004, which recovered from 2009 and 2011. Since then, South Africa operates in a trade deficit.

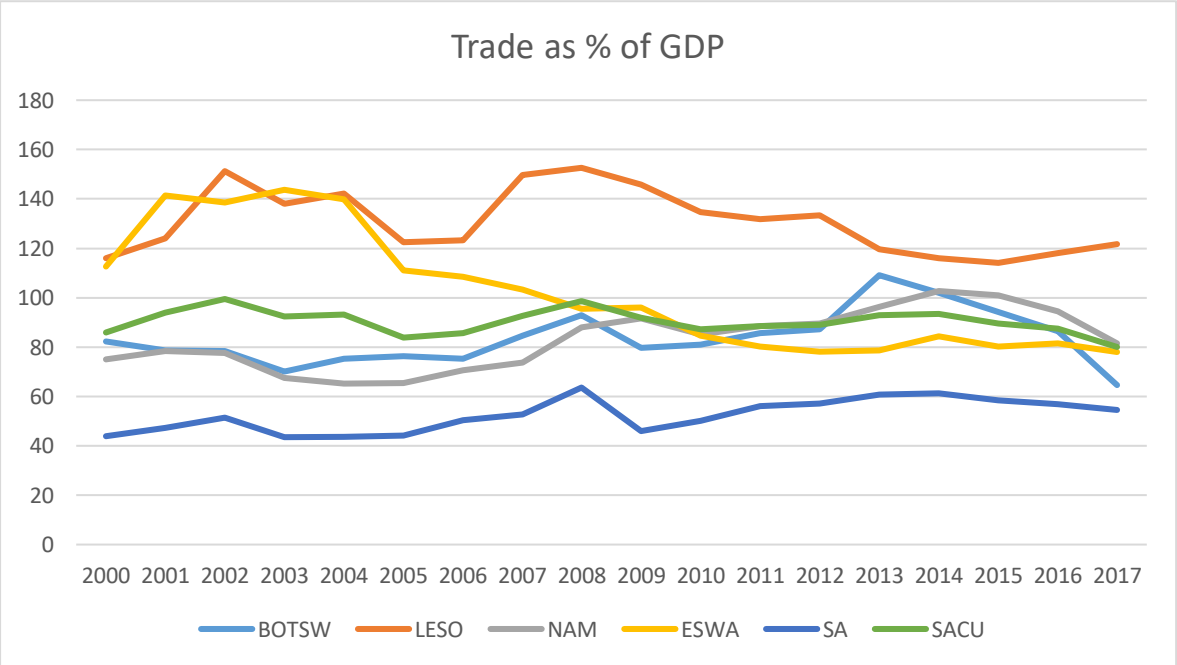

Figure 1.3: Trade as a percentage of GDP

Source: Author's compilation based on the World Bank Development Indicators (2015)

According to the South African Reserve Bank (2017), a weak global economic growth existed in recent years, suppressing the export demand for South African manufactured goods. The persistent decline in investors' and consumers' confidence discouraged many private businesses operations. Botswana later joined its partners in the deficit performance. OECD (2015) documents that since 2008 Botswana experienced persistent deficits in merchandise trade. The country experiencing a fall in the export revenues accompanied by an increase in imports spending in the country during the global financial crisis period. This explains the sudden decline in the trade openness in 2009 in all the member states.

Contrastingly, despite SACU's long existence, its trade with countries or blocks located outside the SACU region remains dismal. SACU (2013) reports that from 2010 to 2013, 86% of SACU's exports were channelled outside the SACU region. Only 14% were traded within the region of member countries. The reason for such a divergence was that Eswatini and Lesotho imported 90% of goods and services from South Africa whilst sources trivial imports from the other SACU countries. SACU's imports and exports form a minimal weight of the world's trade. According to the SACU (2013:18) report, "they constitute 0.59% and 0.64% of the world's exports and imports, respectively". The region's main exports include primary products especially minerals, such as gold and diamonds. Regarding imports, the SACU region imports fuel, equipment and machinery. Most trade is dominated by one SACU country, South Africa, suggesting that it is the largest economy amongst member states. The small member states do, therefore, not often participate in trade.

1.2.2.3 Gross capital formation

The countries' national statistics presented by the WBDI (2019) consider gross capital formation as the total domestic investments comprising expenditures towards the economy's fixed assets and stock changes. Stock refers to accumulations of business or industries inventories for needs and contingent purposes in sudden changes in demand or other economic conditions.

Figure 1.4 reflects the average level of gross capital formation in the region. Gross capital formation increased though with minor oscillations between 2000 to 2008. The years 2005, 2009, and 2013 recorded the highest fall in gross capital formation. The worst Gross Capital Formation growth (GCFG) rates were recorded in 2013. During the same period, Botswana experienced the least rate of GCFG rates of -13.75%. The performance of the SACU region was also affected by the global financial.

Eswatini recorded lower-than-average growth during the period, except in 2016 when it stood the highest with 16 when all other countries were below five. Namibia performed well above the regional average throughout the period except for a sudden slump that pulled down to the lowest levels of -22.33% and -21.15% in 2016 and 2017, respectively. The National Planning Commission (NPC) of Namibia (2018) attributes the slump in GCFG to a decline in most industries. The most significant drop was recorded in mining and quarrying in real terms from N$16 billion in 2015 to N$7.8 billion in 2016 (NPC 2018), resulting in a contraction of 51.4 %. South Africa maintained an average level of growth, except for a substantial sharp fall in 2009.

The evolution of GFCF (2017) documents indicates that first, real GFCF expanded slowly in the period following the 2008/9 global financial crisis compared to the preceding six years. Second, regardless of this slower growth, it remained above its long-run average of 18.3% (1990 to 2016) since 2006 and was sustained by the annual increase in investment, frequently exceeding the growth in GDP. Another reason cited was the structure of the capital investment by type of organisation. The contribution of the private business sector to GFCF was 72.5% from 2000 to 2008, whilst the public sector only contributed 11.5%. Subsequently, the contribution by the private sector fell to 61.1% in 2016, which could not be compensated by the slight increase of 20.2% in public sector corporations. On average, the SACU region performed well until 2015. The period after that to-date experienced a decline in gross capital formation, as indicated in Figure 1.4.

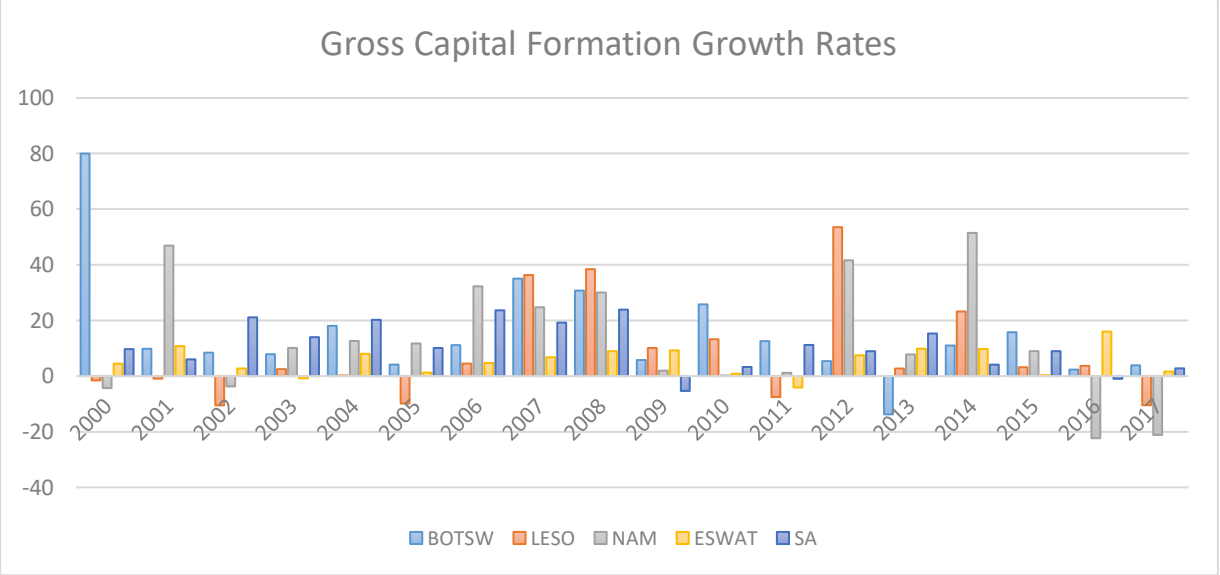

Figure 1.4: Gross capital formation growth rate

Source: Author's compilation based on the World Bank Development Indicators (2019)

1.2.2.4 Human development index

This index comprises indicators on the health conditions of the economy, the levels of education attainable and the general welfare of the population. The HDI is an average measure that summarises three major indicators: health, education, and the standard of living. UNDP (2019) explains that HDI is measured as an index calculated through averaging normalised indices reflecting the health conditions, the education standards, and the welfare dimensions. Life expectancy at birth is used as an indicator of the health dimension whilst the years of schooling for adults aged 25 and more. The expected years of education for children of school entering age measures the education index. Gross national income (GNI) per capita indicates the standards of living dimension. Figure 1.5 reveals an increase in the HDI across all SACU countries since 2000.

The highest development was experienced in Botswana and South Africa, followed by Namibia, Eswatini, and Lesotho, respectively. The general awareness of inequality and poverty reduction initiatives, gender imbalances, and promotion of equal participation and empowerment in economic activities could have contributed to this. The Millennium Development Goals (MDGs) and their development into the SDGs

observed most developing economies tailor-making their policies towards achieving the development goals. SDGs were conceived in a bid to develop solutions to sustainable futures for 17 goals. These included the following:

- no poverty
- zero hunger
- good health and well-being
- quality education
- gender equality
- clean water and sanitation
- affordable and clean energy
- decent work and economic growth
- industry
- innovation and infrastructure
- reduced inequalities
- sustainable cities and communities
- responsible consumption and production
- climate action
- life below water
- life on land
- peace, justice and strong institutions
- partnerships for the goals (United Nations 2019).

This turnaround observed an increase in development focus in SACU countries, despite other challenges.

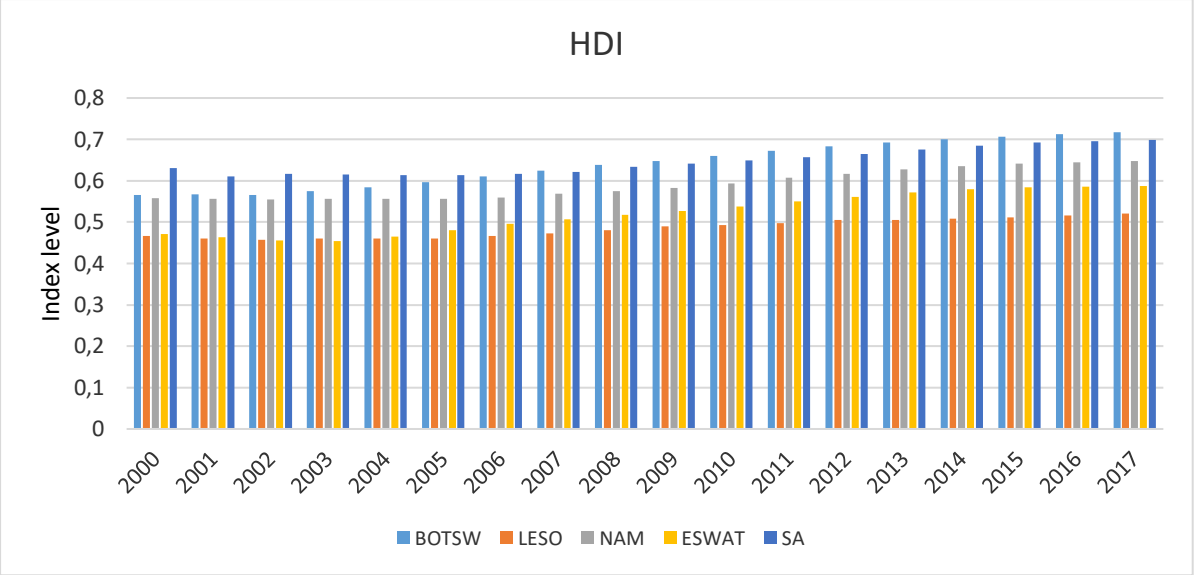

Figure 1.5: Human Development Index

Source: Author's compilation based on the World Bank Development Indicators (2019)

1.2.2.5 Income inequality

Another concern encountered by the SACU region is prominent levels of income inequality. Income inequality became significant distress as it disturbs the capacity of development, the economic structure, and the standards of economic performance across the member states. It is essential to emphasise that South Africa is the most developed economy across the SACU region; Lesotho was the least in 2015 based on output growth rates (World Bank 2017). The World Bank rates Botswana, Namibia, and South Africa under the middle-income earning category whilst Lesotho and Eswatini rates in the lower middle-income economies.

Intra- SACU countries' inequalities grown to be a daunting challenge noted even globally. In Figure 1.6 SACU countries exhibit higher income inequalities than countries with similar levels of GDP per capita. Botswana, Lesotho, and Namibia all exhibit much higher Gini coefficients than other SACU members. Eswatini's Gini coefficients are equal to its peers but have the highest levels of inequalities in the region. In contrast, South Africa has a Gini coefficient slightly higher than the average of countries at similar income levels.

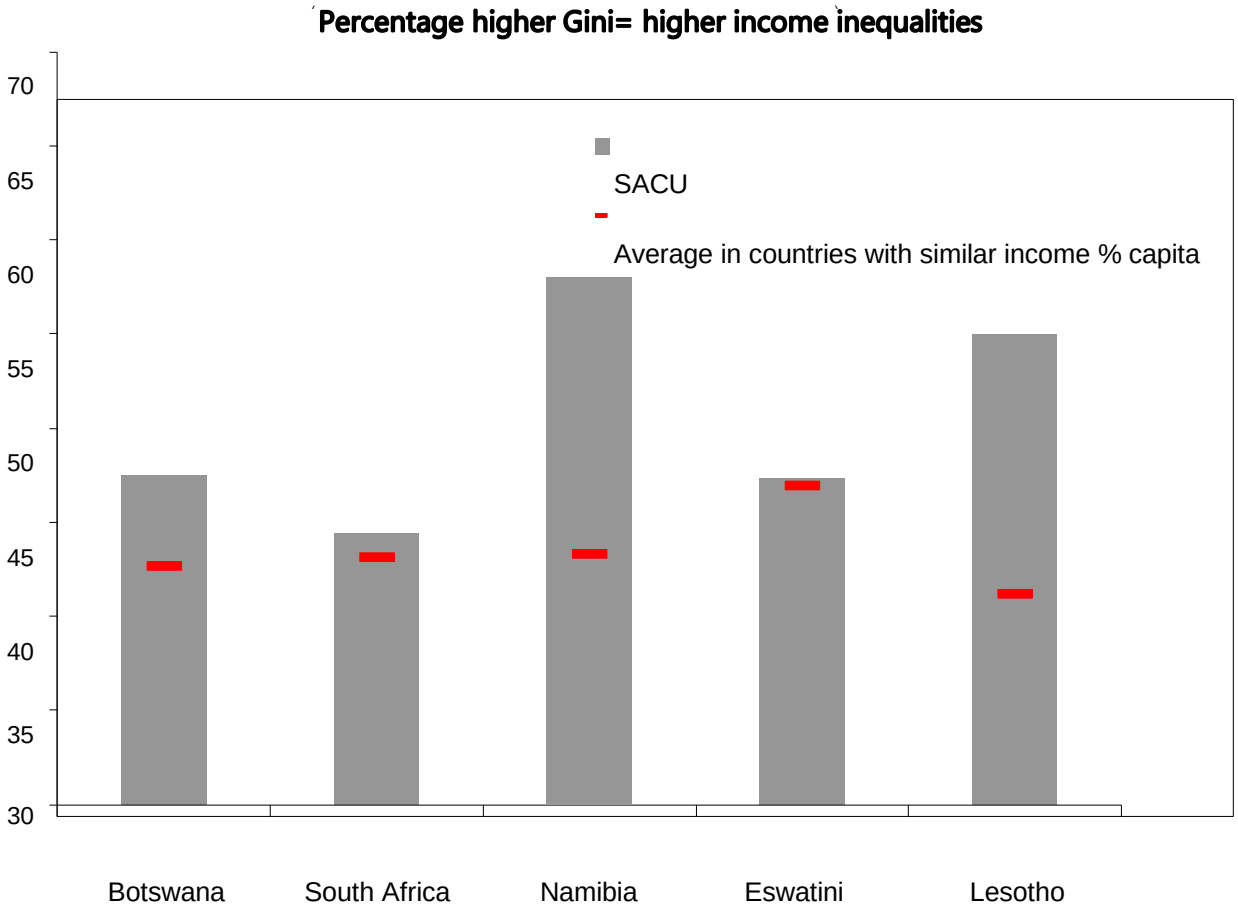

Figure 1.6: Comparisons of Gini coefficients amongst SACU countries

Source: UNU-WIDER (http://www.wider.unu.edu) and IMF staff computations cited by Basdevant et al *(2012:11)*

Whilst SACU existed for a long time in Africa, it is expected to have managed to reduce this daunting challenge of reducing inequalities amongst member states. The levels, as revealed in Figure 1.6, raise interest to establish whether regional integration can be a remedy policy to reduce inequalities in SACU member states.

1.2.2.6 Poverty

Manwa and Wijeweera (2016) comment on the prevalence of poverty in the SACU countries has drawn back the efforts devoted to better the standards of living of the general citizens in the member states. Social indicators reflect critical challenges experienced in SACU countries. The indicator statistics presented in Table 1.1

indicates that the proportion of people living below the poverty datum line are more than half of the total population in Lesotho, South Africa and Eswatini. Namibia and Botswana have the lowest levels that do not exceed 30%. The analysis of data regarding the poverty levels across the years where data were available; there is some light that poverty alleviation progressed in four member countries except Lesotho, which increased between 2002 and 2010. Conversely, the poverty level accelerated in Lesotho from 56.6% in 2002 to 57.1% in 2010 (World Bank 2015). The divergences in the statistics are contributed by poverty surveys conducted contrarily across the region in the period.

Table 1.1: Poverty headcount ratio at national poverty lines

YEAR	BOTSWANA	LESOTHO	NAMIBIA	ESWATINI	SOUTH AFRICA
2000	30.6	-	-	-	35
2001	-	61.3	-	69	-
2002	-	56.6	-	-	-
2003	-	-	31.5	-	-
2005	-	-	-	-	26.1
2008	-	-	-	-	16.9
2009	19.3	57.1	22.6	63	-
2010	-	-	-	-	16.5
2014	-	-	-	--	18.9
2015	-	-	13.4	-	-

Source: Author's compilation based on the World Bank Development Indicators (2019)

Poverty is still an issue within the SACU region. Lesotho and Eswatini, despite being smaller economies (GDP levels) and considered as lower-to-middle-income countries, still encounter higher levels of poverty (World Bank 2019). The challenges hindering the efforts implemented to lower poverty levels include lower levels of economic productivity, unfavourable climatic conditions, the prevalence of pandemics diseases, declining employment opportunities and high inequalities (World Bank 2019). Lesotho managed to reduce poverty from 61.3% in 2001 to 56.6% in 2002. By 2010, it increased to 57.1%. It is further reported that most people in Lesotho live in poverty and their main activity is subsistence farming (World Bank, 2019).

As for Namibia, notable progress was achieved. The World Bank (2019 b) reports the same than for Lesotho and Eswatini that poverty levels remain high despite the middle-income status. The country has more than half of its population living below the national poverty line. Considering the income status of Namibia as a country, the extent of poverty is too high. Most notably in developing countries, the vulnerability lies mostly with the child or female-headed families, large families, the elderly, and the low-income earning groups, such as labourers in the subsistence farming areas.

Poverty declined from 30.6% to 19.4% between 2002 and 2010. The reduction was mainly in the rural areas, contributed by a rise in earnings from the agricultural activities (Botswana Poverty Assessment Report, World Bank 2015). Although a decline was noticed in the region, still the biggest economy, South Africa according to Table 1.1, presents high levels of poverty with 18.9% in 2014. This picture is one of the reasons for undertaking this study as a way of establishing the relationship between the economy's wealth and poverty reduction. The statics collected reflect clearly that SACU countries are challenged with poverty; therefore, pushing for an investigation identifying whether regional integration may be considered as a policy remedy to such a grappling issue.

1.3 PROBLEM STATEMENT

The process of integrating regionally marks the initial steps into a globally integrated community. This process has more excellent anticipated benefits, which can be regarded as solutions to the daunting challenges encountered by the SACU countries. Some of the benefits derived from this process include enhanced growth of the economy and trading activities, reduced poverty, and inequalities, and steering sustainable development through the bargaining power and harmonisation of their economic policies. Manwa (2015) notes that before the regional integration concept spread, it was difficult for countries to be liberalised and benefit much from trade. Despite multilateral organisations and the WTO, the gains from trade emanating from regional integration were not as exploited as with multilateral organisations. Obstfeld (2016) contends that though improved trading activities can enhance productivity, the process can be hurtful unless there is a deliberate approach in policy to distribute the benefits. This is because countries differ in their political and economic influences and

these differences also cause policy changes, which influence how fair the gains accumulated can be distributed. As such, these benefits are not uniformly distributed amongst the member countries, as some will benefit more than others.

Through trade, member states benefit from expanded market access and the availability of various goods at affordable prices. Products can be traded from those countries that can efficiently produce them at cheaper costs, which will benefit all member states, expanding both economic development and welfare gains. Ahmed (2016) considers regional integration as a useful tool that countries can employ to advance their socio-economic developmental outcomes.

SACU (2016) asserts that SACU envisions to become an economic community hinged on fair and sustainable development. This approach is believed to be critical for the improvement of the welfare of the SACU population. The formation of SACU is a living example of regional integration. This is aimed at diversifying the economic activities through expanding and introducing new industries, promoting trade and investments within the SACU region, and aiding their competitiveness within the globe. They also aimed at coordination and harmonising the countries' economic policies to meet the common developmental goals of the region. Research investigating whether SACU has managed to live up to its mission and vision is yet to emerge in the broader regional integration literature.

In its mandate, SACU member countries trade freely within the region. They charge a common external tariff to non-member countries. Santos-Paulino (2015) contends that allowance for a free flow of private investments induces competition, which stimulates economic development, poverty reduction, and improving the population's social and moral well-being. There is a revenue pool from which SACU distributes to member countries, according to the commonly agreed measure and the least-developed benefit more from this arrangement (SACU 2016). All the SACU countries, except for South Africa, rely heavily on the SACU revenue pool. It comprises a more significant percentage of their national budgets. It is one of the significant benefits enjoyed by member states from this integration.

Though SACU member countries rely heavily on the revenue pool to finance their national budgets, the contribution that South Africa makes to the region through development aid cannot be over-emphasised. This development aid is transferred to Botswana, Eswatini, Lesotho and Namibia and forms part of the revenue sharing agreement (SACU 2016). Consequently, the development aid component in the revenue sharing agreement is 1% of South Africa's GDP. Compared to the international aid of 0,7% of GDP, it can be concluded that South Africa is most generous in its support to fellow member states in SACU. Provided the benefits as stated the concern becomes the main question to be answered in the current study regarding the influence of regional integration on socio-economic development of the member countries.

It is reported that in trade negotiations, SACU continued work to conclude and implemented several trade agreements with third parties (SACU Annual Report 2019). Some of the milestones taken by member countries towards participating in the global community include the AfCFTA agreement, COMESA-EAC-SADC Tripartite Free Trade Agreement (TFTA), the Mercosur Preferential Trade Agreement, the SADC trade protocol with the SACU-EFTA Free Trade Agreement, and the SACU-USA trade, Investment and Development Corporation Agreement.

Further reports conclude that the SACU member states continued to dedicate efforts towards the creation and implementation of the AfCFTA. All SACU member states signed the AfCFTA agreement. Namibia and South Africa ratified the agreement. Another milestone in the COMESA-EAC-SADC TFTA to which four of the SACU countries, Botswana, South Africa, Namibia and Eswatini signed the agreement and South Africa ratified the agreement. Another major achievement was the conclusion of the ratification process for the Mercosur Preferential Trade Agreement in December 2015 by the SACU and Mercosur countries. The SACU secretariat continues to provide support to the member states' participation in the various negotiations on the outstanding issues on each agreement. Despite these efforts and the age of the customs union, the region persistently experiences serious socio-economic challenges. Some of these were discussed in the background part of this study. More worrisome is that all four members heavily depend on South Africa. Then, how has the union benefited the individual member countries?

As aforementioned, the socio-economic indicators of the SACU countries reflect deficient performance in economic growth, gross capital formation, human development accompanied by prevalent poverty and inequalities. Persistence of these economic challenges led to regional leaders, even questioning their membership in SACU. Review of literature revealed limited studies to assess the influences of regional integration in addressing these challenges. Based on the divergences in theoretical literature and methodology, the research assesses the influences of regional integration in socio-economic development in the member states. The study also proffers policy recommendations considering maximising the benefits from this integration based on the findings from this study.

1.4 MAIN RESEARCH OBJECTIVE

The main research objective was to analyse and evaluate the effect of regional integration on socio-economic development in the SACU countries.

1.4.1 Research objectives

The objectives of this study are outlined as follows:

1.4.1.1 Objective 1

To evaluate the effect of regional integration on various social and economic development factors.

1.4.1.2 Objective 2

To evaluate the effect of regional integration on socio-economic development by:

- Analysing the implications of regional integration on trade
- Examining the effect of regional integration on economic growth
- Analysing the effect of regional integration on gross fixed capital formation growth
- Analysing the effect of regional integration on the HDI
- Analysing the effect of regional integration on inequality levels
- Analysing the effect of regional integration on poverty reduction

1.4.1.3 Objective 3

To provide policy recommendations to the socio-economic problems encountered by the member countries, based on the study findings.

1.4.1.4 Objective 4

To provide applying the proposed SRII as a way of providing policymakers with accurate regional integration impacts.

1.5 RESEARCH HYPOTHESIS FOR OBJECTIVE 2

The study's research hypotheses are as follows:

- H0: Regional integration does not have a positive effect on economic growth.
- H1: Regional integration has a positive effect on economic growth.
- H0: Regional integration does not have a positive effect on gross fixed capital formation growth.
- H1: Regional integration has a positive effect on gross fixed capital formation growth.
- H0: Regional integration does not have a positive effect on the HDI.
- H1: Regional integration has a positive effect on the HDI.
- H0: Regional integration does not have a positive effect on inequality levels.
- H1: Regional integration has a positive effect on inequality levels.
- H0: Regional integration does not have a positive effect on poverty reduction.
- H1: Regional integration has a positive effect on poverty reduction.

1.6 RESEARCH METHODOLOGY

This study aimed at evaluating the effect of regional integration on socio-economic development in SACU countries. This study was complex because it measured regional integration and socio-economic development employing several indicators falling under various dimensions. This is also made worse by the complexity of the concerns in the SACU countries, diverse goals and the various economic goals sought to be achieved. This study explored, described, and tested causal relationships amongst diverse indicators, employing a quantitative approach to the study.

This study explored the literature comprehensively to reconcile the findings in this area of study. This was followed to aid a deeper understanding of the problem at hand and to gain more insights before applying the conclusive methodology to confirm the findings. The lack of a widely recognised or agreed measure of regional integration motivates for a descriptive research design. The reason this study developed the SRII, is a composite of four dimensions. Various indicators were employed under each aspect. The choice of variables and indicators depended on data availability and the application in the SACU context.

Lastly, after developing the index, the relationship between regional integration and socio-economic development in the case of SACU countries was assessed through applying OLS (LSDV), fixed effects and random-effects models. This was necessitated because every year considered in each country provides a different cross-section reflection on how regional integration influences socio-economic development. Employing panel data enriches the findings as the cross-sectional values are jointly analysed over time. The use of panel data allows for the cross-sectional values to be jointly analysed over time to produce richer results which can be used as robustness checks. The socio-economic variables employed in the analysis are economic growth, measured by the real GDP growth rate, gross fixed capital formation, the HDI, poverty and inequalities measured by the Gini coefficient. The regional integration component was represented by the regional integration index developed in this study.

1.7 DATA SOURCES AND ANALYSIS

This study employed panel data for the five SACU countries. These countries are South Africa, Namibia, Botswana, Eswatini and Lesotho. Data were obtained from the SACU statistical database, the World Bank World Development Indicators, the United Nations database of income inequalities and human development and individual countries statistical offices. According to Moyo (2014), sources in the public domain aids to reliability and validity of the study as they reduce the business established in private subjectively collected data. The data were processed and analysed, employing several statistical packages, including Microsoft Excel and Stata. Stata was employed in constructing the SRII using the principal components analysis and the pooled data analysis. This package was selected because of its flexibility and its ability to

customise the codes needed to run the indicators for SRII. It was the best to use since it has more built-in features to deal with panel regression analysis.

1.8 EXPECTED OUTCOMES AND SIGNIFICANCE

The reasons behind all these efforts to integrate regionally or globally are because of the potential benefits associated with the union towards common objectives. Warin et al (2009) express doubt on the expected benefits in the African context due to poor governance implied by weak structures, institutions and policies and a lack of diversity associated with African states. This study, therefore, is essential to clarify, expose and aid to literature. This can help individuals and authorities to clear these debates, providing that other nations are calling for increased integration whilst other countries view integration as disadvantaging the smaller economies and only benefiting a few large economies.

The findings of this study are vital to development economics practitioners, policymakers, advocates, researchers in the academic field and private institutions through its emphasises on the focus areas needing attention to benefit the diverse economies. The index, with the identified relationship between regional integration and socio-economic development, can help shape individual countries' specific policies. With the areas of weaknesses identified in the constructed index and the long-run equilibrium estimations conducted in this research, individual-specific policies can be developed with the areas. The entire region can benefit.

1.9 SCOPE AND DELIMITATION

This study aimed at empirically investigating the effect of regional integration on socio-economic development in the SACU region. It is based on the panel data collected on all the members of the SACU regions, indicating Botswana, Lesotho, Namibia, Eswatini and South Africa from, 2000 to 2017. The panel approach was applied in data analysis, therefore, providing a total of 90 observations comprising 18 years in each of the five SACU countries.

1.10 THE THESIS OUTLINE

The introductory chapter discusses regional integration as a global policy priority that can be used to solve the various socio-economic and political issues encountered in the SACU region. This chapter discusses the background of the social and economic challenges encountered by SACU countries. The discussion regarding the challenges encountered by SACU member countries indicates that the region is far from fulfilling its vision and mission. SACU countries are characterised by persistent issues around the primary areas that define the socio-economic development of the economy. These challenges include low levels of economic and investment growth, elevated levels of poverty and inequalities and little human development as expected, according to literature and aspirations of regional integration.

This disconnection between theory and practice motivated the need for a closer investigation regarding the effect of regional integration on socio-economic development in the SACU member countries. The research problem statement, research objectives and hypotheses are also discussed in the introductory chapter. A brief description of the methodology employed in the study is provided in the introduction section. The chapter also describes the expected outcome and the significance of the study. The chapter concludes with an outline of the research.

Chapter 2 presented the theoretical review of the literature, focusing on the two strands of economic inquiry, regional integration, and socio-economic development. First, regional integration theory progressed from the classical approaches to the dynamic methods to deep integration up to developmental regionalism. Regionalism in Africa was evaluated in this section of the study. These theories revealed how regional integration progressed, encompassing broader integration suiting diverse economic setups.

Diverse ways through which regional integration was measured in previous studies were also discussed. This concerns the most common composite indices, such as the European Union Regional Integration (EURII), an index for the Arab world, Asia-Pacific Regional Integration Index (APRII) and the African Regional Integration Index (ARII). The second part of the chapter discusses the socio-economic development concept.

Various policy initiatives towards socio-economic development, such as the MDGs and SDGs, are evaluated. A discussion regarding how socio-economic development is measured is also provided in this section. Individual indicators used in various empirical studies are also examined in this chapter. Most notably is the HDI, which is a composite measure of human development, encompassing critical standards of human development, such as education, health, and real GDP growth per capita.

Chapter 3 focuses on the empirical literature review. As expressed in many development agents and researchers, Africa is moving towards a more connected, competitive, and business-friendly continent. There is a growing emphasis on the importance of regional integration in Africa, resulting in an increased academic interest focusing on the effect of this integration and friendliness relationships around the continent. The blocs frequently investigated include EAC (Mwasha 2007; Erick 2011; Muthonga et al 2013; Muriuki 2015; Nnyanzi et al 2016), SACU (Manwa 2015), SSA (Rekiso 2017; Ahmed 2016), SADC and SACU (Chanda 2010), ECOWAS, SACU, UEMOA and COMESA (Kumar et al 2014), COMESA, EAC and SADC (Kamau 2010).

The aforementioned study areas indicate the deficiency in research concerning the SACU region. The research methodologies and the indicators applied in previous studies were inconsistent. There is no composite measure of regional integration suggested from the empirics reviewed, which also brings a methodological divergence fulfilled in this study. The empirical literature review also revealed that no research was conducted in the SACU region, observing the holistic concept of socio-economic development. Most researchers focused on the traditional economic output measures, and therefore, failing to incorporate the social well-being into the development conclusions. This is another theoretical divergence that this research filled, making a meaningful contribution to the literature on regional integration in the SACU region.

Chapter 4 discusses the methodology applied in this study. The first section of the chapter focuses on the research approach, research strategy, sampling and type and nature of data and data sources employed in the study. Data analysis is also another element of the methodology explained in this chapter. The data analysis articulates how the construction of the SRII was done, and then the testing of the relationship using panel data techniques. The methods and procedures used in developing the

regional integration proxy are evaluated in this chapter. This is an index comprising l indicators reflecting regional integration. These methods are organised in steps starting with variable selection, data normalisation, weighting and aggregating. The second part presents the discussion on the pooled OLS (LSDV), the FE and the random-effects modelling for further inquiry into the relationship.

Chapter 5 presents and discusses the results in the construction of the SRII. These results are reported through all the processes followed from selecting variables, data normalisation, the aggregation scheme, and the weighting of each indicator in each dimension. The overall index is constructed on each of the SACU countries, Botswana, Lesotho, and Namibia, Eswatini and South Africa and the SACU overall index.

Chapter 6 discusses the results on the main research objective, which sought to analyse the effect of regional integration on the socio-economic development in the SACU countries. The first part of the results re-examines the main variables by presenting their descriptive measures. This is followed by the presentation and discussions of the pooled OLS (LSDV), fixed and random-effects models generated from the panel data.

Chapter 7 presents the study conclusions based on pursued objectives. Literature, methodological and practical contributions are also discussed in this chapter, with the policy and practical recommendations of the study. This chapter concludes with the recommendations for further research, emphasising on the shortcomings of the study.

CHAPTER 2: THEORETICAL LITERATURE REVIEW

2.1 INTRODUCTION

The study involved two major concepts in development economics, regional integration, and socio-economic development. The review of literature in these areas builds a deeper understanding of regional integration and socio-economic development theories. Additionally, it also discusses how regional integration is measured in the literature. The socio-economic development concept is also discussed with the different views surrounding the concept.

2.2 REGIONAL INTEGRATION THEORY

In the field of development economics, regional integration is considered a global phenomenon. Peiris et al (2015) define regional integration as a movement pursuing agreements and understanding on the removal of anything that hinders the ability of member states in a region to exchange or trade goods and services freely. Regional integration process ensures smooth flow of trading activities at no costs or restrictions within the region. It ensures that economic policies are coherent and harmonised across the member states.

Literature reveals that the integration process amongst developed economies differs from the developing economies. The new theories on regional integration are more applicable to developing and least-developed economies. Their perceptions and expectations from this process and the explicit constraints limiting these economies are not dissimilar; each country has its own, according to its environment and conditions surrounding.

The European Union (EU) dominate regionalism literature. Critics posit though, that the EU is entirely detached from the global experiences of regionalism. Regionalism in the EU is unique, indicating a context-specific construct, which cannot be generalised to other contexts. Ravenhill (2016) observes that the exclusion of EU experiences may deprive the body of literature and knowledge since other groupings are pursuing activities like those previously implemented in the EU. Although some institutional forms are unique and do not exhibit the options available to various

economies globally, it is wise to observe all the possible cases to enrich the literature. In their survey findings, Peiris et al (2015) indicated that both the theories, the classic and new integration theories present an excellent platform to evaluate the desirability of regional trade agreements (RTAs). There should, therefore, be a focus on both theories. The history and stages of development of regional integration theories from the static theory through the dynamic theory until the new developmental regionalisms are unpacked in this section of the literature review.

Traditional theories, also known as the static theories of integration, dates to the 1950s. Following this, writers such as Baldwin (1997), Schiff and Winters (2002) extended these theories to provide for the elements of imperfect competition. Page (2000) reveals that the traditional approaches to RI are in contrast to the developmental regionalism. Developmental regionalism is the modern theory of regional integration, focusing on developing economies. It is increasingly becoming popular, especially in writings concerning the effect of RI in Africa. There is significant momentum towards deepening the understanding regarding regional integration, especially in developing economies.

2.2.1 Evolution of regional integration theories

Viner (1950) is the ancestor of the RI theory because he was the first to write about theories analysing the influence that a CU would have on the member countries and the non-member countries. Academic investigations were interested in uncovering the implications of these agreements on the economies involved. The two main concepts, trade diversion and trade aversion effects, explaining the effects of economic integration, are clarified in the static analysis by Viner (1950). The theory on the static analysis of economic integration separates the trade diversion and trade aversion effects. These concepts still dominate the academic discourse regarding the trade blocks' analysis.

2.2.2 The static theory of integration

The static theory is a diversion from the traditional belief that conceptual movement from the general notion that CU is a definite welfare enhancer. Instead of focusing on how the diverse integration schemes affected the economy, Viner (1950) attempted to

establish the motives for their formation. The comparative advantage theory advocates for free global trade to enhance consumer and producer benefits from purchasing from the cheapest suppliers. These benefits would be possible since production will be set in places where factors of production are cheaply available. As a result, the final goods would then be freely distributed to all other locations. In this theory, Viner (1950)'s assumptions were that the goods under trade were homogeneous.

Comparing the costs of production for import substitute goods and the export goods, the import-competing goods are more expensive to produce than the export goods. Viner (1950) also assumed a perfect competition set up in the commodity and factors market; perfect factors mobility within a country, no inter-countries and no transport costs involved. The opportunity costs of production were factored into the price of goods. Ad valorem tariffs were the only trade restrictions posed, added to the assumption of balanced trade and full employment of resources.

In contrast to the assumptions of this theory, establishing trade barriers is an obstruction hindering free trade as expected. Based on this, foreign supply is eliminated and promoting locally produced goods to replace imports despite producing them at excessive costs. Export-oriented producers encounter the same disadvantage as they cannot freely access markets outside their home country. The main challenge of CU based on the Viner (1950)'s theory centred around the issue of protecting the goods and services from moving without restrictions. Implementing a CU has the potential to enhance trade amongst member states. Its desirability though would be influenced by whether it is creating trade for member states or diverting trade to a costly producer within the region, increasing trade levels. Viner (1950) explains the diverse sources of trade increase as follows:

- Trade creation resulting from a shift by consumers from domestic costly produced goods to those produced by the partner countries due to intra-union trade, as the tariffs had been removed. Trade creation occurs when two economies enter a trade agreement; trade flows shift from the country that used to produce at a higher cost to where production can be cheap

- A situation where imports refocus from a country producing cheaply, which is not part of the agreement to those producing at high costs part of integration agreement because of tariff removal on member states.

It can be concluded that Viner extended the classical free-trade theory emphasising on the potential welfare impacts of integration. In his argument, Viner (1950) is in support of trade creation, claiming that it increases the welfare of the citizens, whereas trade diversion reduces the welfare of citizens. Cole, Lyons & Cary (1999) citing Viner (1950) contends that when considering the economic welfare increase effects of a CU, it can only be observed as a partial or an imperfect way of achieving what could be achieved if there could be a global policy removing trade barriers. The static theory, therefore, implies that countries would be motivated to engage in integration if the result is trade creation trade rather than trade diversion.

Viner (1950) defined the effects of these concepts expressing an argument that trade diversion causes an inefficient allocation of resources, although welfare can be gained through trade creation. The effect of trade diversion on reducing welfare affects the member states and the overall world welfare. The conclusion that a complete CU is indicated by the total absence of duties between members in such a way that the potential benefits equal the undesired effects leading to the two effects cancelling out.

Summarising the contributions by the other researchers to the works of Viner (1950), according to Cole et al (1999), several researchers have enhanced Viner's theory by examining other issues concerning the effects of integration. It appears it is not definite that custom unions improve global standards of living (Meade 1955; Lipsey 1960; Baldwin 1997; Schiff & Winters 2002). Meade (1955) concludes that more economical use of resources might be influenced by the existence of a CU. It may be a subject of the circumstances around the case.

Scholars criticised the static model based on the assumptions on which it was found. For instance, Gunning (2001) contends that the assumption of no scale effects disputes the whole essence of the issue at hand. Lipsey (1960) and Gehrels (1956/7) amongst other critics, raised concerns over the omission of consumption effects arising from RI. Researchers proved that changes in relative prices of the member

countries concerning the world escalated the effect of regional integration. Lipsey (1960) indicated that a CU might be welfare-enhancing as it depends on the circumstances surrounding the union. Therefore, in some cases, trade creation may occur whilst in other instances, trade diversion results.

De Rosa and Govindan (1996) emphasises the significant effect of tariffs reduction in the static theory. The benefits from reduced tariffs are not fully realised, especially under trade diversion situations as consumers will be encountered with costly goods replacing low-cost products from all over the world. Welfare effects resulting from the integration model may not be captured well due to the deception by tariff revenue loss. The revenue sharing amongst the member states might be important in ensuring fairness and compensation to those that do not gain from trade creation. The world economy assumption does not fully reflect the actual economic reality. OECD (2003) contends that a huge portion of the world trade is dominated by large blocks, such as the EU, which proves the limitations of the static gains theory.

2.2.3 The dynamic theory of regional integration

The dynamic theory was developed to complement the static approach. This theory identified exceptional cases, solved by general equilibrium models. These models aim to analyse and devise policy remedies to issues arising in integration agreements. Unlike the static theory effects with distinct theoretical treatments, the dynamic theory effects are broken down into a series of a separate, unrelated phenomenon, which often requires more than a single model to capture them (Brada & Mendez 1988).

Balassa (1961b) and Cooper & Massel (1965) are the first researchers who introduced the dynamic effects theory of economic integration. Balassa (1961b) used several factors to define the dynamic impacts of regional integration. These factors include expanded benefits from the increasing scale of operations, technology levels changes, the structures of the prevailing markets, the market structures, productivity, risk and uncertainty and investment activities (Balassa, 1961b). This view was recently aired by Hosny (2013) who argued that dynamic impacts of integration would cause increased competition, transfer of technology and investment flows. Dynamic impacts of integration were also defined by Schiff and Winters (1998) as anything with the

potential to affect both media to longer periods growth in the state of the countries in the region.

The static analysis was proved inadequate by the events that occurred around the 1960s. Based on Viner's conclusion that a preferential trade policy is favourable to a CU in liberalising trade, is enough proof that the static analysis is inadequate in assessing the welfare impacts of regional integration. This deficiency justifies the introduction of the analysis of the dynamic impacts concerning regional integration. The dynamic analysis explains the purpose of CU creation and an integration system. In the 1960s and 1970s, Europe experienced rapid integration concurrently with high economic growth rates in the European Commission Area (ECA) and the European Free Trade Area (EFTA).

Arguello (2000) comments that this occurrence resulted in the common belief that economic integration positively affected the level and growth of economic activities. Disappointingly, empirical evidence established that the gains were minimal. In the beginning, the successes recorded in Europe appeared to have emanated from the static effects. It was believed that the static effects resulted in trade barriers being removed amongst the member countries. Further explanations of the RTAs successes are now investigated through analysing the dynamic effects.

According to Manwa and Wijeweera (2016), early researchers in the 1960s focused on investigating the dynamic effects, specifically the growth of the economies. These studies indicated that the resultant growth was due to high investment levels and more rapid technological progress in the regions studied. Various authors explained that this relationship could be due to distorted market structures and their operations and the possibility of cost advantages attained as the industries expand. Helpman and Krugman (1985) discovered that imperfect competition, technology, and barriers to market entry imposed by policies lead to the emergence of monopolies. This indicates that where firms enjoy monopolistic profits, especially where production is more efficient, and the product can be differentiated from others.

This differs from the static theory, which postulates the similar goods produced by perfectly competitive firms. Country size and location in the RTAs is also an influencing

factor, explaining the gains or losses that could be accrued. Schiff and Winters (2002) provide evidence about the engagement of various sized economies in an agreement, as to whether the small countries can obtain similar proportions of benefits. Small countries could enjoy equal benefits when they join large integration communities. Smaller economies joining a large regional integration could enjoy equal benefits (Schiff & Winters 1998) though this is yet to be reported in the regional integration literature in SACU countries. Research also indicates that lowering the duties on imported goods from member countries would increase its welfare. This would occur through factors, such as increased consumption of low costs of imported goods. This would cause costly locally produced goods and services substituted by cheaper imports from the countries that can produce more efficiently. The greater margin of substitution makes it more beneficial for smaller economies that could be joining integration with large economies.

Research indicates that geographical proximity has a critical role in regionalism (Krugman 1991; Jacqueim & Sapir 1991). According to the EU (2013), the countries closely located, with highly complementary resource shares, could derive large benefits if they converge and trade as a block than trading as individual countries.

On the critics of the dynamic analysis, Cole et al (1999) contend that the only distinct set back is that, unlike the static theory, the dynamic analysis is constraint by the absence of a method to quantitatively assess its effects. Today's modern free economies provide a platform for the analysis of economic effects. Dynamic analysis has a more in-depth scope, and therefore, its effect is more significant on the economic process than the static effects. Cole et al (1999) summarise these effects as high costs of investing, high products demand, specialised and highly consolidated production, improvement in the production management, technology improvement, optimum use and distribution of resources, more efficiency in production and high growth rates in economic status.

Calfat, Granato and Flores (2000) attempted to test these dynamic effects in the Argentinian economy by evaluating the dynamic effects of Mercosur. The evidence supported the argument that the effect was positive and would lead to economic growth. Te Velde (2008) empirically examined how developing economies can

converge and growth from integrating regionally. Te Velde (2008) investigated South Africa, Benin, and Malawi at a firm level. The study discovered significant dynamic effects for productivity at a firm level from regional integration in Africa.

2.2.4 Deep integration

Evans et al (2004) clearly explained the differences between shallow and deep integration. Shallow integration is the agreement to allow free trade, leading to trade flow shifting from the country that produced at a higher cost to the one where production can occur cheaply. Imports are diverted from a country that produces cheaply, which is not part of the agreement to one producing at high costs as part of the integration agreement. Whilst deep integration involves implementing structures, institutions and policies enhancing trading activities by lessening the regulatory requirements and (Evans et al 2004) the other hindrances inside the country which could be both formal or and formal.

De Rosa and Govindan (1996) observed that though the non-tariff barriers were gradually removed, ample administration and regulatory barriers remain in the countries. These barriers motivated the integration of the European trade (Emmerson et al 2016; Kimbugwe et al 2012). Therefore, integration in Europe was aimed at redressing the main issue in deep integration by harmonising procedures in the administration sections and the standardising of the products in the member countries. Based on this, integration sought to increase economic welfare through the expansion of markets for trade goods. This would be achieved by cutting production and distribution costs. This indicates that the welfare gains will be more than the losses incurred from shallow integration. In support of this, the levels of trade within the regions in Africa is low concerning the total trade, mainly because of similar structures in economic and trade areas (Te Velde 2005).

2.2.5 Developmental regionalism

Theory of developmental integration came as a reactive theory to the problems market integration posed. The perceived increase in productivity associated with the removal of trade barriers is mostly evidenced in industrialised countries. This is due to their large, diversified industrial structures were a variety of alternative areas or sectors to

reallocate resources exist. Page (2000) explains that the existing industrial structures in developing economies are relatively small concerning their economies or the desired levels of socio-economic improvement. The static gains for rationalising these amongst the member countries are small.

The developmental theory, therefore, believes that improving the socio-economic status of member countries are at the core of regional integration purposes. Development integration demands a more stable intervention by the state than a mere market integration, suggesting that it is deep integration because it encompasses reforms apart from removal of border restrictions. Political integration is also an essential requirement for this model, as it is believed to be a critical construct for the cooperation foundation. This makes it easier for member states to progress concerning implementing policies aimed at solving the primary cause of market failure within the RTAs unfairly distributed proceeds or benefits amongst the member states (McCarthy 1997).

Concerning this problem, McCarthy (1997) proposes compensatory and corrective policies to solve the challenge of unequal distribution of benefits. Asante (1997) also suggests that an explicit framework should complement regional integration schemes. The framework must have measures designed to ensure that new complementary investments are allocated equally to ensure the same pace of industrialisation in the member states (Asante 1997). Krugman (1991) observes that smaller states are characterised by a lower capacity to industrialise on their own. The integrative process must address issues of less capacity for industrialisation in the member countries. This would require that favourable policies be implemented to redress this issue in smaller economies.

In practice, the concept of developmental integration proves to be more challenging to implement, compared to market integration. A developmental approach to developing economies is also criticised compared to trade creation and diversion theories. Bhagwati and Panagariya (1996) note the argument in this theory as that as the third party's imports increase in percentage share in the region's total imports, the more significant the revenue lost to this regional engagement. The same applies to the

member countries with higher tariffs before regional integration. Their loss increases as more revenue from tariffs are provided to another country, not part of them.

Most developing economies rely on trading with other countries, not within their trading blocks, even in cases where high tariffs are imposed on them, as such they experience so much loses when they form RTAs. The associated costs from trade diversion will increase, not only for individual member states but the whole region in this agreement. This is the reason most developing countries' regional groupings fail.

In Africa, schemes were implemented to compensate for such loses to member states. In certain groupings, they distributed the revenue from the customs pool amongst the member countries, but this attempt could still not address the problem of unequal industrial development (Shams 2003).

Concerning state intervention, the integration processes' success is determined by the level of influence the countries in the regions have over the processes of producing and distributing the goods. Evidence from African RTAs indicates that the usual cost and price decisions do not regulate production by the state or the market forces. Therefore, such activities would be inefficient. With the prevailing situation of corruption and rent-seeking behaviour, even the state entities, which may be hailed as a means of jump-starting the industrialisation process within an RTA, may not be efficient. These activities weakened all the efforts to improve trading across the borders and the efficiency of structures and policies aimed at enhancing economic growth and general welfare.

2.3 Regionalism in Africa

Ravenhill (2016) defines regionalism as a process by which governments of different closely located countries work together, harmonising their economic and political policies towards achieving set common goals. Ruggie (1995) also observes regionalism as a collaboration with a group of economies governed by a generalised code of conduct. With this kind of integration, it can be concluded that regionalism is a social institution. Regionalism can be applied as either functionalism, economic or political to address various objectives. One of the most notable features of regionalism

is that it imposes constraints on the state autonomy, but the extent depends on the type engaged in.

Functional regionalism is an inter-state collaboration aimed at specific concerns. The most common ones in Africa being the river basins, transportation links and meteorology and the generation of improved infrastructure through regional economic gains. Africa has many small landlocked countries. With this nature, poor infrastructure becomes a significant impediment in Africa. Examples of successful functional regionalism in Africa include:

- A regional pool of power stations, such as the Southern African Power Pool (SAAP), established in 1995.
- Development of water resources, such as the Senegal River Basin water resource developmental project.
- The ECOWAS Centre for Renewable Energy established in 2010.

Political regionalism refers to an agreement where the primary objective is to enhance the collective bargain of member states as one group which cannot be gained if they operate individually. A perfect example that has succeeded in this form is the African Union (AU). The AU was key in the facilitation and institutionalisation of a collective voice for African states beyond what the member states could achieve individually. AU, as a community, did not break because of apartheid. Their political affiliation kept holding although economic collaboration was weak. Despite the constraints on national autonomy, political regionalism was the most beneficial tool that could be employed to promote the participation and contribution of individual countries, boosting their sovereignty.

Economic regionalism is a strong contrast between the two aforementioned regionalism forms, which impose a few constraints on the state economy. It refers to collaboration efforts of member states to allow for free trade across the region. This category includes free trade areas (FTAs), customs union (CU) and the common markets (CM) and economic union (EU). These reflect a hierarchy of constraints imposed on state autonomy. The FTAs are popular because of fewer restrictions. WTO (2013) recorded that of the 420 RTAs in 2016, 90% were FTAs and the rest were

CUs. It only requires that the countries allow for free trade in their membership. A CU is said to be more intrusive on the state economy in that it requires collective agreement to harmonise the tariffs charged on non-member countries. Common markets are similar, allowing free movement of capital and labour. The economic union further allows a common currency leading to the harmonisation of major economic policies, such as the monetary policy of member states.

The transition up the hierarchy is sequential, as FTAs will discover that it is best to be a CUs to reduce the transactions costs. In turn, they see the necessity to allow for a free flow of capital and labour within the region. Based on the success of the CUs, further desire to maximise on the benefits from integration will impel a common currency to limit the costs in movement of capital and transacting. At each level of success in the development from an FTA to a CU, the government autonomy continues to be constrained.

The SACU and Common Monetary Area (CMA) agreements are both biased towards economic integration without functional and political considerations. Four of the five SACU countries are members of the CMA. These are South Africa, Namibia, Lesotho and Eswatini, an important feature of the CMA economies is their state of macroeconomic convergence, particularly on critical macroeconomic indicators in promoting economic, stability and growth. These include inflation, budget deficit as a percentage of GDP, and external debt as a percentage of GDP (Bank of Namibia 2013). The benefits associated include reduction of transactions costs since 80% of NLS's imports are sourced from South Africa (Bank of Namibia 2013). The absence of the need to exchange their currencies into the South African Rand (ZAR) to obtain these goods and services represents a significant saving in transaction costs.

There is also the elimination of exchange rate fluctuations, which helps to promote economic stability. Provided the volume of the LNS trade with South Africa and the extent of investment flows from South Africa, a fixed exchange rate with South Africa promoted economic stability. These also benefit from financial development and deepening. The degree of their involvement with global capital markets is low. Their economy and financial system relied heavily on South Africa's currency and such reliance are still extensive today.

Policy credibility is another angle of benefits enjoyed. Policy credibility is earned over a long time through consistent government behaviour. CMA membership and its associated macroeconomic implications were important in sustaining investor confidence in the LNS. The CMA arrangement is a contributing factor in the ability to maintain price stability in the countries. This leads to the conclusion that SACU countries, being in CUs is not open like countries that opened to economic, functional, and political regionalism. The outcome of this research may help policymakers to consider expanding or improving SACU from a CUs to other forms or functions.

2.4 MEASURING REGIONAL INTEGRATION

Deeper regional integration benefits economies through the expansion of markets, maximisation of optimum resource allocation, increasing productivity, simultaneously boosting investment opportunities. Other social and political benefits can be enjoyed by member states, indicating greater security, political stability, and social harmonisation. To grasp and maximise on these benefits, a need exists to implemented proper mechanisms so that progress in regional integration can be easily monitored and evaluated against the set goals (Hur & Park 2012).

These dynamic and development concerns coming up in the regional integration area have raised so much interest in using composite indicators in academics and policymaking. This is especially because it is not easy to capture the various indicators in defining a concept. Being a global concern, different institutions globally developed their region-specific composite measures suitable for their specific environments. The most common ones being EURII, Regional Integration Index for the Arab world, APRII and the ARII. The next section discusses composite measures in various contexts.

2.4.1 Regional integration index for the Arab world

The United Nations Economic and Social Commission for West Africa (UN_ESCWA) developed the Regional Integration Index for the Arab world in 2006. According to the United Nations (2016), Arab countries are classified concerning their contribution to regional economic integration. This contribution is measured by four economic variables: the trade occurring inside the region (intraregional trade), intraregional investments, intraregional tourism, and the workers' remittances. A statistical method

was used in assigning the indicators' weights with greater weight allocated to those indicators that would vary the most across the countries involved. The PCA was employed to combine the four variables into a single measure to rank the member countries.

2.4.2 The European Union Regional Integration Index

The EURII index presents two versions. First, is the EU-15-Index (2011), developed as a way of measuring the level of integration into the EU for each member state of the old 15 EU countries annually since 1999. This earlier version was further refined into the EU-25-Index (2012), which considered the member states of the 25 EU countries annually since the eastern enlargement in 2004. The EU integration index was the first instrument applied to the members of the EU. This enabled measuring their economic integration. It also enabled the ranking of members regarding the degree of their integration into the EU (Konig & Ohr 2013).

The EU index comprises four dimensions: (i) EU openness and EU importance, (ii) EU homogeneity, (iii) EU symmetry and (iv) institutional conformity also established in two sub-categories: EU participation and EU compliance. Each of these dimensions has indicators. The EU openness and EU importance variables have similar indicators in name, but they are measured differently. The trade in goods, services and capital movements under the trade openness variables are measured as a percentage of GDP. In contrast, those under EU importance are measured as a percentage of the total trade in goods, total trade in services and total FDI, respectively. EU importance focuses on the level of each member's trade contribution within the block.

The construction of the EU Index was done using two significant steps. First, the means of the indicators are weighted to produce a composite dimensional index.; Second, the dimension index is also derived through averaging the indicators and assigning weights, yielding the overall index for regional integration. The index is also calculated using PCA, and the indicators have unequal weights. The four dimensions and their respective indicators used in the construction of the index are summarised in Table 2.1.

Table 2.1: EURII dimensions and indicators

	Dimension	Indicators
	Single market: EU openness EU importance	• trade in goods • trade in services • capital movement • labour migration • trade in goods • trade in services • capital movement • labour migration
	EU homogeneity	• per capita income • purchasing power standard • labour cost • long-term interest rate • public debt ratio • consumer tax rate • capital tax rate
	EU symmetry	• economic growth • inflation • change in unemployment • government budget deficit
	Institutional conformity: EU participation EU compliance	• Economic Monetary Union (EMU) membership • Schengen participation • Infringement proceedings • Environmental and Consumer Protection (ECJ) verdict (single market) • ECJ verdict (environment and consumer protection); ECJ verdict (other sectors)

Source: Author's compilation based on (Konig & Ohr, 2013)

2.4.3 Asia-Pacific Regional Integration Index

The Asia-Pacific Index was developed by the Asia Development Bank (ADB) in 2017. It was designed as a tool for assessing the degree of integration on different socio-economic dimensions across the 48 countries and six sub-regions. The index also seeks to compare the strengths and weaknesses of integration in the context of member states' economies and tracking the progress. The index comprises 26 indicators grouped under six dimensions which include trade and investment integration; money and finance integration; regional value chains; infrastructure connectivity; free movement of people; and institutional and social integrations. APRII was constructed using two major steps.

First, the indicators in each dimension were assigned aggregated weights, resulting in the composite dimensional index. Second, the dimensions were also assigned weights, and the weights were also averaged, yielding the regional integration for each member state. PCA was also applied to determine the weights in each step. The dimensions and indicators are presented in Table 2.2.

Table 2.2: APRII dimensions and indicators as adopted from the UNECA report (2016)

No.	Dimension	Indicator
	Trade and investment integration	• The proportion of intraregional goods exports to total goods exports
		• The proportion of intraregional goods imports to total goods imports
		• Intraregional trade intensity index
		• The proportion of intraregional FDI inflows to total FDI inflows
		• The proportion of intraregional FDI inflows plus outflows to total FDI inflows plus outflows
	Money and finance integration	• The proportion of intraregional cross-border equity liabilities to total cross-border equity liabilities

No.	Dimension	Indicator
		• The proportion of intraregional cross-border bond liabilities to total cross-border bond liabilities
		• Pair-wise dispersion of deposit rates averaged regionally relative to that averaged globally
		• Pair-wise correlation of equity returns averaged regionally minus that averaged globally
	Regional value chain	• The ratio between the averaged trade complementarity index over regional trading partners and the averaged trade complementarity index overall trading partners
		• The ratio between the averaged trade concentration index over regional trading partners and the averaged trade concentration index overall trading partners
		• The proportion of intraregional intermediate goods exports to total intraregional goods exports
		• The proportion of intraregional intermediate goods imports to total intraregional goods imports
	Infrastructure and connectivity	• The ratio between the averaged trade cost over regional trading partners and the averaged trade cost overall trading partners
		• The ratio between the averaged liner shipping connectivity index over regional trading partners and the averaged liner shipping connectivity index overall trading partners
		• Logistics performance index
		• Doing Business Index (overall)

No.	Dimension	Indicator
	Free movement of people	• The proportion of intraregional outbound migration to total outbound migration
		• The proportion of intraregional tourists to total tourists (inbound plus outbound)
		• The proportion of intraregional remittances to total remittances
		• The proportion of other Asian countries that do not require an entry visa
	Institutional and social integration	• The proportion of other Asian countries that have signed FTAs with Design of Trade Agreements (DESTA)
		• The proportion of other Asian countries that have an embassy
		• The proportion of other Asian countries that have signed business investment treaties with DESTA
		• The proportion of other Asian countries that have signed double taxation treaties with UNCTAD
		• Cultural proximity with other Asian countries relative to that with all other countries

Source: UNECA (2016: 11)

2.4.4 The African Regional Integration Index

UNECA (2016) contends that the measurement of regional integration is important in the designing of economic policies for development in Africa. Despite the need for measuring regional integration, it is important to be able to assess the progress concerning the goals and plans set. UNECA (2016) notes that it is imperative to track what has occurred and the progress concerning trading activities, labour and capital movements when designing or evaluating policy frameworks. UNECA (2016) emphasises that regional integration is crucial in Africa as it becomes more connected, competitive, and business-friendly. Based on this, UNECA (2016) designed an action tool called the ARII to measure progress in Africa.

The ARII was developed through the coordinated efforts of the African Union Commission (AUC), the AfDB and the Economic Commission for Africa (ECA). These organisations observe the whole concept of regional integration as a practical arrangement that could help obtain things move freely across the continent.

Following the declaration that the integration of the economies is a priority towards development in Africa, the ARII was developed as a tool to measure the degree of integration in every regional community and its member states towards the commonly set objectives. The ARII is also intended to identify the weaker areas to inform decision-making processes aimed at achieving the integration goals (UN 2015).

The index is critical in that it helps member states to identify the strengths and areas where improvement is needed by observing five dimensions with a total of 16 indicators following up on their progress and changes over time. The Abuja Treaty of 1994 and its framework informed the dimensions and indicators included in this ARII. This treaty launched the negotiations for a continental free trade area aiming to achieve a whole centralised system that will benefit the AU member countries. The broader aim of this treaty is trade, economic integration, socio and cultural development and active participation in all sectors of human activity.

The treaty also seeks to raise the member countries' citizens' welfare, ensuring the stability of the economies and establishing good beneficial and peaceful relationship across the member countries. It is imperative to emphasise that the broadness and comprehensiveness of the index render it a suitable proxy for regional integration in this study. It covers more factors that influence the member countries' social and economic well-being. These five dimensions and the respective indicators are summarised in Table 2.3.

Table 2.3: ARII dimensions and indicators

	Dimension	Indicators
1.	Regional infrastructure	• Infrastructural development index: Transport, electricity; ICT; water and sanitation
		• The proportion of intraregional flights
		• Total regional electricity trade (net) per capita
		• The average cost of roaming
	Trade integration	• Levels of customs duties on imports
		• Share of intraregional goods exports (% of GDP)
		• Share of intraregional goods imports (% of GDP)
		• Share of total intraregional goods trade (% of intra-REC trade)
	Productive integration	• Share of intraregional intermediate goods exports (% of intraregional exports)
		• Share of intraregional intermediate goods imports (% of intraregional imports)
		• Merchandise trade complementarity index
	Free movement of people	• The proportion of REC member countries where nationals do not require a visa for entry
		• Ratification (or not) of REC protocol on free movements of persons
		• REC member countries where nationals are issued with a visa on arrival
	Financial and macroeconomic integration	• Regional convertibility of national currency
		• Inflation rate differentials

Source: Author's compilation based on UNECA (2016)

2.4.5 Comparing and contrasting the indices

The first index for the Arab world is not as comprehensive and extensive as the other indices because only four economic variables were employed as indicators. These variables include trade, investments, tourism, and workers' remittances. The only similarity it has with other indices is that it applied the; PCA as the EURII and the APRII. The index shares similar motivations and construction process with the ARII.

There are two features, which distinguish the APRII and the ARII. The APRII has a component capturing the role played by investment flow across the border and the interconnections of the financial markets in enhancing regional integration. This variable is, however, not considered under the ARII.

Another feature that makes ARII different from the other three indices discussed earlier in this chapter is structural. ARII adopts an arithmetic average; thereby, all components are treated as equal. The APRII, EURII and the Arab world Index use PCA in calculating the weights. The structural improvements on APRII are a plus as the ARII has been criticised by Gor (2017) on the same basis.

Gor (2017) published a selective audit on the ARII, which raised several issues concerning the methodology used in the calculation of the index. The five stages followed in the process are selecting the variables, standardisation of the variables measures, calculating each dimension's contribution, calculating the individual countries' index and, lastly, the calculation of the overall index of the regional community. Gor (2017)'s audit focused on selecting indicators stage and the final stage of calculation of the overall index by REC. It can be argued that Gor (2017)'s concern was that the ARII was not founded on any theoretical basis. However, it explains the link between the dimensions selected and its respective indicators. The individual indicators applied in the index seems to have been chosen in an arbitrary manner (Gor 2017), suggesting that little attention was paid regarding interrelationships.

On the calculation of the overall ARII index, it can be argued that the index is structurally flawed. Gor (2017) contends that using equal weighting on the indicators imply that the dimensions will have various weights since they have a different number of indicators, and this significantly affects the structure of the index. According to Gor (2017), there are the different number of indicators under each dimension in the ARII. The various dimensions in the ARII have a different number of indicators. For instance, there are four indicators in the trade and infrastructure category, followed by productive and movement of people with three and the financial and macroeconomic has only two. Using an odd number of indicators may pose a challenge in that the

dimensions with many indicators may weigh more than those with less. Eventually, the constructed index will not be balanced (OECD 2008).

Considering the above, based on the selective audit, the construction of the index in this study was based on the contributions from consultations with the experts drawn from the SACU and other economists in the field. This is crucial as it helps concerning redefining aspects were necessary, to produce the most reliable evaluation. Hur and Park (2017) recommend it as the most applied statistical method in the construction of the composite index. Gwartney and Lawson (2001) said the PCA is only applicable in cases where each dimension is based on various aspects of the composite index. OECD (2008) recommends the same method. This is the most useful tool amongst the currently available weighting schemes, especially when the dimensions have a smaller number of indicators (from 0 to 10) as explained in the methodology chapter in this study.

2.5 SOCIO-ECONOMIC DEVELOPMENT

Development can only be concluded to have taken place where there is evidence of a change, implying that the state of things has moved from one condition to a better one. Drewnowski (1966) associates this change with a difference in the state of life of the population and a measurable increase in many economic and social indicators. It is a case of either qualitative or quantitative growth of societies and the economy.

This concept of development can be the process by which the state of a country is evolving through the worst situation where it is just stagnant to an early industrialisation stage. This is where economic activities are primary activities, characterised by high unemployment and low-income levels to a dynamic, well-diversified, highly integrated and industrialised economy. Chojnicki (2010) defines the concept of socio-economic development as involving transition in societal lifestyle and environment especially those involving the state of the country's nature.

Though economic aspects are often evaluated in studies that investigate changes in the economy, they cannot be isolated from the social aspects. Based on the interrelationship between economic and social elements, it can be concluded that

social and economic development cannot be separated. Development can only be concluded if the quantitative growth is leading to quality changes in the lifestyle of people. A series of studies by the United Nations Research Institute of Social Development (UNRISD) (1970), reveal that development is pronounced by the attainment of a better lifestyle. This includes the state of the society's welfare (United Nations Research Institute of Social Development (UNSRID) 1970).

The primary goal of any developmental effort is to improve the standards of people's life. The objective of development is to raise the standards of people's living. Development as a concept does not only consider increases in measurements of economic levels but it also involves changes in the arrangements in societies to the betterment of the standards of living alongside good economic performance (Mabogunje 1980).

In history, development always focused on the economies' income rather than the people's living conditions. Mabogunje (1980) says that development is interpreted using four major aspects, indicating economic growth, modernisation, distributional justices, and as socio-economic transformation. The ancient writers in the World War II days could not differentiate development from an increase in economic output. More focus was on the levels at which per capita would be rising and the structures defining the state of the country would be. During the 1970s, the attention of development economists shifted towards people living in poverty. The research revealed that many of the growing economies would have high per capita rates but there would not be any positive signs on the welfare and state of the citizens' living.

One of the writers, Seers (1969) identified the areas of improvements in development goals by raising questions of whether around the increase in the quantity of output and incomes at the expense of wider social divergences, a lack of basic necessities and a lack of opportunities for the people. Following this discussion, it is imperative to note that the discussion amongst scholars shifted from being growth-oriented to aiming to increase the standards of living through enabling people. They would obtain employment opportunities, achieving a more equal society and ensuring access to basic necessities. (Seers 1979). Mabogunje (1980) also notes that economic growth is critical in transforming nations into modernised nations. This modernisation of

nations was considered the social transformation effect of economic growth where societies attempted to access products similar to those enjoyed by people residing in developed countries.

The modern economists have been awakened to recognise that only the standards of living make the difference between lifestyles led in developing from those in the developed nations. The deteriorating standards of living as evidenced by the continuous outbreak in diseases, malnourishment, and mortality rates in most of the countries not yet developed helped in twisting the perceptions of developmental objectives designed in these economies. Academics, such as Stiglitz (1998), made a great contribution towards the broadening of development views and objectives to incorporate social issues. These include addressing income inequalities, reducing poverty levels, ensuring the preservation of natural resources for sustainability, improvement in healthcare facilities and standards and the education sector development. According to the World Bank (2015) enhancing the standards of living is at the core of development goals.

2.5.1 Millennium Development Goals

Much was conducted to indicate the transition in the views of development objectives. The year 2000 saw the birth of the MDGs. This was led by the United Nation with the common objective of achieving socio-economic development. The declaration made at this agreement, committed world leaders towards poverty eradication, reducing hunger and starvation and improving health standards. This was to end the emergence and spread of diseases, ensuring high literacy in their populations, women empowerment and reduce gender-based inequality and guarding and ensuring environmental sustainability.

The declaration resulted in setting agreements of the eight MDGs by UN member states to attempt to achieve them by 2015. MDGs defined the targets and the indicators that member states can use to monitor progress levels from 1990. The MDGs were as follows:

MDG 1 was targeted at eradicating excessive poverty and starvation, hunger, aiming at reducing the rate by 50% between 1990 and 2015.

MDG 2 aimed at ensuring wider inclusive basic primary education for all.

MDG 3 aimed at lessening gender inequality and women empowerment.

MDG 4 targeted at reducing the child mortality by two-thirds the under-five mortality rate between 1990 and 2005.

MGD 5 aimed at improving maternal health and lower the number of deaths in a by three-quarters. A second target under this MDG was to ensure everyone easily and affordably access health care.

MDG 6 aimed at combating the pandemics of HIV/AIDS, malaria, and other diseases by halting them by 2015 and reversing the spread of HIV/AIDS and malaria. The second target was to improve universal access to treatment for HIV/AIDS for all those who need it by 2010.

MDG 7 was to ensure environmental sustainability by halving the proportion of people without sustainable access to safe drinking water and basic sanitation.

MGD 8 was to coordinate policies and initiatives at a global level for developmental goals achievement.

According to the United Nations (2015), unprecedented efforts resulted in profound achievements, although they are not evenly distributed. Developing countries were falling behind despite the World Health Organisation (2016) noting that by 2013 there were notable achievements in some economies in addressing the health set targets. A sizeable number of countries were still struggling to reduce the spread of HIV/AIDS, economic difficulties, and social disagreements. Because most countries did not achieve the MDGs, the member states agreed a need exists to pursue the goals, nonetheless this time with a focus on sustainability (UN 2015). This resulted in the new development agenda discussed in the next section.

2.5.2 Sustainable development goals

Following the unfinished business in the form of MDGs, a new agenda emerged still aimed at addressing development issues to achieve sustainability. The UN summit in 2015 adopted this agenda to attempt to change the world towards providing basic necessities and improving the states of the economies. Simultaneously environmental cautious to sustain, avoiding conflicts and observing the rights of the people (UN

2015). SDGs have a broad and universal agenda comprising 17 SDGs outlined as follows:

- Ending poverty everywhere
- Stop cases of hunger, ensuring nutritious food security and investing in long-lasting agricultural projects
- Increasing access to healthy lifestyles and social well-being of everyone
- Providing inclusive non-discriminatory education that gives lifelong learning opportunities for all
- Ensure gender equality and women empowerment
- Sustainable management of water and sanitation for everyone
- Ensure access to affordable, reliable, sustainable, and modern energy for all
- Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
- Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation
- Reduce inequality within and amongst countries
- Make cities and human settlements inclusive, safe, resilient and sustainable
- Ensure sustainable consumption and production patterns
- Take urgent action to address climate change and its impacts
- Conserve and sustainably use the oceans, seas and marine resources for sustainable development
- Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation and halt biodiversity loss
- Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable, and inclusive institutions at all levels
- To promote the efforts towards integration and global agreements to pursue development

These SDGs indicates that the development debate is dynamic and indicates that more research is always required to develop developmental outcomes contemporary. The next section focuses on the comparisons and contrasts of the MDGs and SDGs.

2.5.3 Comparisons and contrast of MDGs and SDGs

The analysis of the MDGs and the SDGs reveals that the United Nations prioritises poverty eradication. This suggests that global leaders recognise that it the most burning issue all globally and a key for the economies to develop sustainably. It is imperative to indicate that both initiatives identified poverty eradication. Poverty directly influences social well-being in an economy; it is, therefore, a key indicator in socio-economic development. Apart from poverty eradication, both initiatives recognise the importance of education. MDGs focused on achieving universal primary education. The focus of SDGs is to ensure that member countries can provide a non-discriminatory and a high standard of education whilst promoting lifelong learning opportunities for all (UN 2015). This reveals that the SDGs are much broader than the MDGs and are concerned with all levels of social development.

The UN emphasises achieving equality in all dimensions, and it is essential to emphasise that both MDGs and SDGs contend a situation where there are no gender inequalities and the marginalised groups in societies, such as women and children, are empowered (UN 2015). Gender imbalance is one of the factors limiting development outcomes specifically in developing economies, as some members are deprived of exposure and economic participation. By empowering these marginalised women and girls, economies will be better off. Lessons learnt during MDGs evaluation revealed that less privileged economies lag in achievements. As a result, these lessons could have contributed to the new focus of ensuring equality of people in one country and equality at country levels.

An evaluation of the SDGs brought forward the bias towards the health-related targets, including lowering child and maternal deaths, stopping the emergence, and spread of pandemic diseases and improving access to healthcare. Though SDGs also focus on health targets, the approach is holistic as the targets are aimed at achieving healthy lives and the promotion of well-being. Both the MDG and SDG initiatives consider

environmental sustainability as key to socio-economic development. The SDGs further investigates energy accessibility and affordability and sustenance. This ensures the reactiveness to climate conditions cases, conserving the natural environment and natural products for long life investments and protecting, restoring, and promoting sustainable use of terrestrial ecosystems. The SDGs are broad and observe most aspects of the natural environment's sustainability.

The last objective of promoting integration and global agreements is one key strategy to achieving Vision 2030, both the MDGs and the SDGs value these networks and cooperation. Adding on to the common goals, the SDGs also investigate economic growth and productivity with the view of ensuring the full and equal participation of all individuals and involvement of all sectors of the economy to enable sustainable development. More importantly, SDGs focuses on continued development based on infrastructure development. SDGs also strategise on how they can ensure that the consumption and production patterns are occurring sustainably.

Also, a focus on ensuring an inclusive society with no conflicts that observe fairness in treating citizens and the setting up of properly governed institutions to drive sustainable development is an addition of the SDGs. This is different from the MDGs' focus and a key factor as far as governance is concerned in sustainable growth and development.

Conclusively, though the two share prevalent supports; the SDGs are built on the MDGs by seeking to transform their approach to achieve inclusive, people-centred, and sustainable development for everyone. The SDGs' agenda justifies its efforts towards promoting social and economic development as aiming to promote economies prosperous and innovative to improve the living conditions whilst protecting their environments (UN 2015).

2.5.4 Types of socio-economic development processes

According to Chojnicki (2010), the socio-economic development process can be modelled as either spontaneous or target-oriented. Spontaneous processes have no targeted desired outcomes because they are not intentionally activated or steered by people. This is different from the target-oriented processes by which the outcomes are

guided by the activity and behaviour and arrangements made by people (Chojnicki 2010). The socio-economic development resulting from regional integration is viewed as a target-oriented development process. Nations enter integration agreements with some targets they seek to achieve through those associations (Chojnicki 2010). Sztompka (2002) says the socio-economic process target-oriented has irreversible stages. Each stage in development has unique characteristics different from the ones already achieved, and each step achieved takes the economic conditions nearer to the desired conditions. Not all target-oriented processes can be considered as development processes.

Development processes are identified using two additional properties. The first development is there if the direction of the transformation is increasing implying there is an improvement in the condition of the indicator being monitored. Hence, against the background presented earlier, this study uses variables, such as poverty, inequality, real GDP, and trade ratios, under which the direction and level of the effect of regional integration on the socio-economic development are investigated.

Second, the flow of the socio-transformations is depended on social processes prevailing. Internal factors are those within the control of the society whereas exogenous are external environment outside the society's control, but that also influence the development process. The external environment also impacts the developmental process. As a result, the development in socio and economic conditions in any society is influenced by the internal and external factors. These factors are important as they determine the pace and the direction of development.

Although countries belong to one regional grouping, the benefits received, or the effect of the integration may not be equal due to different environmental factors, institutions, and characteristics. These factors will affect the outcome of the intervention. For socio-economic development to be attained, it is complemented by other processes, it can be preceded by, or be a consequence of different processes.

2.6 MEASURING SOCIO-ECONOMIC DEVELOPMENT

The aforementioned discussions focus on what development entails. Various institutions, including the UN, WHO, OECD and the ECA, suggested various indicators

for measuring development. The motive, as evidenced by the discussion above, is that multiple concepts are placed under the umbrella notion of socio-economic indicators. Examples from the economic dimension are growth indicators, such as GDP, GNI and investments. Regarding the social dimension, indicators include health, education, distributional justice, per capita GDP, and many others aimed at improving the conditions under which people are living, their well-being and their life situations.

The sustainability dimension, coming from the capital approach, also has numerous indicators that include environmental factors, accumulation of capital and governance concepts (UN 2019). These many concepts involved observed the growth of interest in using composite indicators when measuring social and economic development which is the same case with the measurement of regional integration in an index. The use of composite indicators allows for the analysis of complex, multidimensional phenomena, which cannot be measured directly. One such composite index commonly used in the measurement of humans' development is the HDI constructed by the United Nations (2010).

2.6.1 Human Development Index (HDI)

This measure considers trends in the key areas of human development. These include the ability to lead a long healthy life, access and attainment of education and the quality of one's lifestyle. It comprises variables, expressing the length of lives expected at birth, variables that measure educational levels reached and the level of income concerning the population in one index.

According to the UN (2016), HDI is a measure that emphasises the importance of the population's capacity and capabilities as the basis for predicting the potential for developing the country. It is a tool for evaluating national policy choice where economies performing the same in productiveness may be at various levels concerning development. The HDI only simplifies and captures the human development component under the social dimension of development. The HDI fails to count for inequities (distributional injustice), the level of access to basic necessities, issues of safety and access to opportunities to the general people.

Measuring socio-economic development will be powerful as a combination of index and some individual indicators. This critic on the HDI motivates developing a more comprehensive measure, the SRII constructed in this study. This constructed SRII comprise of both; the composite measures, indicating the infrastructure development index and individual indicators, such as the percentages of intraregional exports and imports. This study employed a composite indicator HDI with other individual indicators as GDP, gross capital formation, poverty levels, and Gini coefficients to reflect the socio-economic development levels of member states.

2.7 CHAPTER SUMMARY

Theoretical literature review reveals that the restricted nature of SACU may limit the SACU region's capacity to benefit from regional integration. According to the definitions in African regionalism theory, SACU can be concluded to be economically integrated only. Political and functionalism integration are not evident in SACU's engagements.

Relating the operations of SACU to reviewed literature, the SACU region is hanging in between the shallow and deeper integration. This study notes there are still numerous non-tariff barriers, which could be eliminated. There are many administrative and regulatory barriers inside the countries hindering the CU policies to be fully implemented (Evans et al 2004). These issues hinder the effectiveness of the CU in improving the socio-economic status of the countries in the region.

Long in CU history, Viner (1950) established that the motives behind customs union formation include benefiting from comparative advantage which advocates global free trade to enhance consumer and producer benefits from purchasing from the cheapest suppliers. In SACU countries, not all products are allowed to freely flow around the region due to infant industry protection policies. Countries have specified some products and services that cannot be allowed to be imported, especially those that local citizens can produce. Conclusively, the infant industry protection adopted by SACU countries distorts the initial motives of benefiting from comparative advantage. Therefore, to fully benefit from a CUs, a need exists for a policy trade-off.

Regional integration theory has progressed from the classical theories, through to the dynamic theories to deep integration up to the developmental regionalism. These different theories revealed the growth of the concept covering different economic characteristics. The classical theory focuses on developed nations, whereas developmental regionalism focuses on developing economies. This chapter has also indicated the development in the measuring of regional integration through the different indexes discussed. The indexes build on the weaknesses of the previous ones. From the discussions in this chapter, it can be concluded that the two concepts, socio and economic cannot be separated. Both quantitative growths, and the quality-of-life matter in the process of development for any economy. Hence, both economic variables and social variables are useful when assessing development.

CHAPTER 3: EMPIRICAL LITERATURE REVIEW

3.1 INTRODUCTION

This chapter discusses and evaluates the empirical studies conducted in various places in the field of regional integration and socio-economic development. This study aimed to assess the effect of regional integration on socio-economic development in the SACU region. Therefore, in attempting to establish literature and methodological gaps, a literature search was conducted. The scope of the empirics considered in this study includes the studies that investigated the effect of regional integration on any aspect or variable indicating economic development or social well-being. To extend the inclusion criterion, this study included studies that investigated individual countries and regional blocs from both developed and developing economies.

The review also considered studies conducted not more than 18 years ago. The studies selected ranged from 2000 to 2018. The choice of the period range made the research more relevant by considering current trends in literature. Concerning research methodology, the empirical review was conducted on those studies that employed the mixed-methods approach (both quantitative and qualitative methods). A collection of these studies is summarised in Table C.1 attached as Appendix C.

3.2 TIME FRAME FOR THE STUDIES UNDER REVIEW

The studies presented in Table C.1 in Appendix C, informs this empirical analysis. As aforementioned, the study reviewed relevant research conducted in the last 18 years, between the year 2000 and 2018. Of these studies, the majority (15 studies) were conducted in the past five years. These studies reflect more on the current focus and the most recent discoveries in this study area. It helps to understand and appreciate the state of knowledge in regional integration and socio-economic. The other 10 studies occurred between 2010 and 2013. These also helped to identify the various trends in writing following the changes in the economic and social situation around the SACU countries. The last six studies were conducted between 2000 and 2010. These studies, though outdated concerning the period where they were published were considered appropriate for this study. They assisted the researcher to comprehend the background in the development and effect of regional blocs.

3.3 AREAS OF STUDY

Concerning the areas of study, the reviewed studies occurred in 26 regions. The geographic regions were grouped into four. These occurred in Africa-based regional blocs; studies that occurred in regional blocs outside Africa; and studies conducted on individual countries either outside Africa or inside Africa. The fourth grouping comprises the studies that combined both Africa-based and outside Africa blocs and countries.

3.3.1 African regional blocs

The first group comprised studies in African regional blocs. These studies enabled a comprehensive understanding of the possible effect of regional integration on socio-economic development in Africa. More than half of the studies occurred in African regional blocs. As expressed in many development agents and researchers, Africa maximising its efforts to be more connected globally, competitive in its economic activities, whilst creating a business-friendly environment in the continent. Regional integration for development purposes was the priority of African researchers and policymakers (UNECA 2016). This attracted growing interest amongst scholars. The blocs investigated are EAC (Mwasha 2007; Erick 2011; Muthonga et al 2013; Muriuki 2015; Nnyanzi et al 2016), SACU (Manwa 2015), SSA (Rekiso 2017; Ahmed 2016), SADC and SACU (Chanda 2010), ECOWAS, SACU, UEMOA and COMESA (Kumar et al 2014), COMESA, EAC and SADC (Kamau 2010).

The reviewed studies reveal that most research in Africa was on EAC. Nnyanzi et al (2016) focus on the relationship between regional economic integration and tax revenue in the EAC. That study established that having well-governed institutions can lead to regional integration increasing tax revenues in EAC (Nnyanzi et al 2016). Muriuki (2015) obtained mixed results on the variables employed in a study that investigated the relationship between regional integration and economic growth. They established that higher growth rates would positively influence TOT and FDI, whereas exchange rates and inflation had a significant negative correlation with GDP. Muthonga et al (2013) investigated the relationship between financial integration and economic growth. They discovered that integrating finance would positively effect on

the rate of economic growth of EAC. Mwasha (2007) studied the regional economic integration benefits to the developing countries in the EAC of Africa. The study findings were that members' benefit through increased trade, expanded markets, FDI attraction, increased bargain, strengthened security and the ability of people to move freely within the region. Studies based on EAC revealed a positive effect of regional economic integration.

Manwa (2015) investigated the link between trade liberalisation and economic growth in the SACU region and concluded that only South Africa benefited in the short and long run whilst other members did not benefit. The effect on economic growth in four SACU countries was insignificant due to trade liberalisation. In South Africa, Rekiso (2017) studied the relationship between industrialisation and regional economic integration in the region. The study discovered a positive, circular, accumulative relationship between industrialisation and REI. This justifies that an increase in economic integration led to successive positive impacts on industrialisation in the SSA region. The effect continues in a cycle and persists in their occurrence.

The association with the advanced economies indicated a negative influence. Ahmed (2016) investigated the relationship between financial markets integration, financial sector development and economic growth. The results revealed that financial integration had a positive influence on financial sector development but could lead to negative economic growth. According to Ahmed (2016), negative results could be because financial markets integration is a part but not necessarily a representation of economic integration. Regional integration includes the liberalisation of other factors, which can cause a positive influence.

Chanda (2010) studied regional integration in Southern Africa, focusing on the future of SADC and SACU. Using a desktop study, he reviewed theories and literature on this subject. He concluded that for Southern Africa to change from LDCs to a large unit block of developed nations, integration efforts and policies are important. This indicates that regional integration has a positive influence. Kumar et al (2014) attempted to establish if economic integration stimulates capital mobility using data collected from the four regional economic communities in Africa, indicating ECOWAS, SACU, UEMOA and COMESA. International capital mobility increased slightly in the

African economies due to these agreements. Kumar et al (2014) noted that these agreements have increased the movement of capital internationally. As for COMESA, EAC and SADC, a positive relation was discovered between regional economic integration and economic growth by Kamau in 2010.

3.3.2 Regional blocs outside Africa

The second stream of empirical literature studies occurred in regional blocs outside Africa. The inclusion of studies outside Africa was necessary to identify distinct context-specific factors, which may influence the effect that regional integration has on socio-economic development. As aforementioned, a need exists for new development theories. This is necessitated as benefits from regional integration and the constraints restricting participation in regional integration arrangements differs amongst developed and developing nations and across continents. Critics arose upon noticing that the EU dominated the literature on regionalism. The opponents posited that the EU is entirely detached from the global experiences of regionalism.

Ravernhill (2016) contends that the exclusion of EU cases may bring more harm to literature since other regional communities are striving to impel activities similar to those in the EU. The same argument motivated the study to factor in studies from outside the African continent even though some institutional forms are unique and do not use all the opportunities available to many other economies globally. It is wise to observe all the possible cases to enrich the knowledge and the theoretical foundations of the study.

There are four reviewed studies under this category, and these studies focused on East Asia (Thomassin & Mukhopadhyay 2010), EU, NAFTA, Mercosur and AFTA (Geldi 2012), USA (Candau & Dienesch 2015) and Europe (European Commission 2013). Candau and Dienesch (2015) studied the link between the spatial distribution of skills and regional trade integration in the USA. The study revealed that highly skilled people chose the core region. Intermediate skill workers move to the periphery (Candau & Dienesch 2015). The spatial distribution of skills was greatly influenced by RTAs. In an analysis of the trade effects of regional integration, of trade effects of regional integration, Geldi (2012) discovered that in the EU, trade creation effects

within the union are six times more than other union effects. The intra-trade was not enhanced by integration in Mercosur.

In East Asia, Thomassin and Mukhopadhyay (2010) established that regional integration resulted in growth in output and increase in import and output shares. The European Commission (EU 2013) reported on the effect of economic and social integration on employment in the context of enlargement in Europe. The report noted that economic and social integration positively affects employment, although the magnitude of the effect will be small and not irregularly distributed. Three from four studies reveal a slightly positive effect derived from regional integration. The only results that exhibit mixed views or contrast are those from the survey by Geldi (2012), revealing varying causes on each bloc. This supports the theory of unequal benefits across different areas, which could be emanating from variances in institutions, policies and economic conditions across countries or blocs.

3.3.3 Individual country-based studies

The third category has reviews that occurred in individual countries globally. This supports the initiative that each country may benefit contrarily from regional integration depending on its exogenous nature, which may differ from other countries (Munemo 2013; Manwa 2015). Manwa (2015) investigated the trade liberalisation, and economic growth link in SACU and Munemo (2013) investigated the potential trade welfare effects of trade liberalisation between SACU and China. These studies indicated that South Africa has a higher possibility of benefiting than the other four countries. Manwa (2015) concludes that South Africa helped in the short- and long run compared to the other members of the group. He established that in the other four countries trade liberalisation had an insignificant effect on economic growth.

Munemo (2013) concluded that tariff liberalisation alone is inadequate for successful trade integration; it benefits mostly South Africa (only) whilst harming some SACU internal and external trades. These findings indicate that despite the countries' participation in an economic bloc, some may stand better chances of benefiting or are disadvantaged in these groupings. Individual economies' studies provide lessons that other countries can learn from.

Individual countries investigated in previous literature include:

- Tanzania (Kweka & Mboya, 2007)
- South Africa (Akinrata 2016)
- France (Figueiredo et al 2014)
- Egypt (Eltahir 2013)
- Ethiopia, Malawi, Mozambique, Senegal, Tanzania and Uganda (UNDP 2011)

The study in Tanzania investigated regional integration and poverty. Results revealed that regional integration reduced poverty through increased exports of agricultural products. UNDP (2011) researched on regional integration and human development in Africa, focusing on the six lowly developed countries. These countries include Ethiopia, Malawi, Mozambique, Senegal, Tanzania, and Uganda. The study established that regional integration has a positive influence on human development (UNDP 2011).

Eltahir (2013) inquired whether trade openness promoted long-run growth in Egypt. The investigations established a positive relationship between trade openness and economic growth. Figueiredo et al (2016) investigated migration and RTAs in France. The study concluded that RTAs stimulates the migration stocks amongst member countries. Akinrata (2016) notes a positive effect of regional integration in an investigation into the regional economic integration concept of the South African construction industry.

3.3.4 Combined African and outside Africa regional blocs and countries

Additional studies included both regional blocs and individual countries in and outside Africa. De Melo and Regolo (2014) commented that even though it may be challenging to implement and impel regional integration within heterogeneous groupings, the efforts would lead to more substantial gains than if the clusters were more homogeneous. This realised more trade agreements amongst countries and blocs across continents. The trade agreements amongst countries or blocs in various continents or at distinct levels, concerning development, can bring a new dimension or a better observation of how regional integration can assist in developing nations. Seven studies were reviewed to bring lessons to this study.

Rougier and Chenaf-Nicet (2016) conducted gravity estimation on the effect of regional integration in the case of Europe and the MENA region trade agreement, focusing on the effect of macroeconomic stability on FDI. This study concluded that FDI between countries increases with source GDP instability and host stability. Santos-Paulino (2015) examined the effect of regional integration on economic development in South Africa, developing Asia, Latin America, and the Caribbean. Santos-Paulino (2015) revealed that regional integration leads to bilateral trade increases, decreases intra-household inequality, and increases GDP per capita growth. This effect was established as strong amongst the countries in developing Asia.

De Melo and Regolo (2014) investigated the African economic partnership agreements with the EU with their reflections inspired by the case of the EAC. The findings indicated that the revenue and welfare effects were minimal. Munemo (2013) investigated the potential trade welfare effects of trade liberalisation between SACU and China. The study concluded that trade liberalisation alone was inadequate for successful trade integration. Trade liberalisation benefited only South Africa whilst harming the other four SACU countries' internal and external trade (Munemo 2013). A similar case study was conducted by Kiyota, Brown and Stern (2007). They analysed the US-SACU Free Trade Agreement. Kiyota et al (2007) established that the benefits of an FTA are small. They concluded that unilateral arrangements, especially multilateral liberalisation, could serve the interest of the global trading community.

Baier and Bergstrand (2007) investigated whether the FTAs increased member states' international trade using 96 countries globally, which included developing and developed countries. FTAs could nearly double any two members' bilateral trade after ten years (Baier & Bergstrand 2007). This estimation indicates that the benefits may be there but are not quickly realised. Venables (2003) attempted to identify the winners and losers from regional integration, using the EU and ECOWAS as a case study. That study realised that countries with comparative advantage perform better compared to countries with extreme comparative advantages.

Based on the review of studies that mixed countries and blocs, it can be concluded that benefits may exist but may not be equal across members. This is attributable to

differences in development levels, levels of comparative advantages, conditions of the agreement and the stability of the economy.

3.4 INTERVENTION DESCRIPTORS / VARIABLES USED

On the intervention descriptors, the review identified 74 variables employed in the 31 studies selected. These variables were employed as proxies for the common themes under investigation. The common issues in these studies were regional integration, economic and social development. The next section discusses the variables employed to define, or as proxies for, each of those themes in the reviewed studies.

3.4.1 Regional integration

Most reviewed studies investigated the effect of regional integration on certain variables. Peiris et al (2015) define regional integration as a movement pursuing agreements and understanding on the removal of anything that hinders the ability of member states in a region, to exchange or trade goods and services freely. The reviewed studies were more biased towards regional economic integration, trade liberalisation and financial markets integration.

The variables commonly used to measure regional integration were average tariffs; trade ratios; trade openness; exports; imports; terms of trade, financial openness, exchange rates, multilateral trade; domestic trade inflows; international trade inflows, average applied statutory tariff rates; average applied collected tariff and total tariff revenue as a percentage of GDP. Evans et al (2004) defined shallow integration as the agreement to allow free trade. This leads to trade flow shifting from the country that produced at a higher cost to where production can be inexpensive, and imports diverted from a country that produces reasonably. This not part of the integration agreement concerning countries producing at extremely high costs. The variables were employed only to indicate how trade was made more accessible amongst the member states.

Conversely, many researchers, including De Rosa and Govindan (1996) observed that though the non-tariff barriers were gradually removed, administration and regulatory barriers inside the countries remain. As Nnyanzi (2016) revealed, East African regional

integration had a significant effect owing to the presence of good institutions. Development integration demands a more stable intervention by the state than mere market integration. This is part of the deeper integration, which encompasses more other reforms other than the removal of border restrictions. Deep integration covers political integration, and it sets the foundation for cooperation. It, therefore, simplify the process for member states to progress concerning implementing policies that help solve the primary cause of market failure, such as the unequal distribution of benefits amongst member states (McCarthy 1997). Cognisant of this limitation, the study takes the broader sense of regional integration, borrowing from modern theories, such as deep integration and developmental regionalism.

Regional integration in this study is measured, employing a composite regional integration index by UNECA (2016), comprising diverse variables apart from the trade variables, focused by reviewed studies. This index comprises variables under-five dimensions, indicating regional infrastructure, trade integration, productive integration, free movement of people, and financial and macroeconomic integration. The broadness and comprehensiveness of the index attain a suitable proxy for regional integration.

In this study, it covers more factors, which affect the socio-economic well-being of the member states. The expectation is also, by analysing the relationship in the SACU region employing such a comprehensive proxy, the effect can be exceeded in the five countries. This is compared to what Manwa (2015) established, employing a few trade-biased variables as proxies for regional integration.

3.4.2 Socio-economic variables

The theme of economic growth is common and over-researched as half of the studies employed in this empirical analysis focused on the effect of regional integration on economic growth. The commonly used growth variables are:

- GDP
- GDP per capita
- capital stock
- investment levels

- FDI
- inflation rates
- external debts
- government revenue and expenditures
- national savings

In this study, the research pattern followed the ancient days when development focused on the economies' income rather than the people's living conditions. Mabogunje (1980) notes that for a long time following the end of the World War II, development was seen merely as economic growth, which implied a rapid rise in per capita productivity and a change in economic structure. The researchers noted that many developing countries experienced high growth rates in per capita income but a slight change in the living conditions of the large part of the population. These 15 reviewed studies concerning empirical literature, contribute to only one aspect of the research and neglect the other important aspect of social factors, which makes the development process complete. This research was also motivated by the lack of a comprehensive assessment of the full development effect of regional integration, especially in the SACU region.

According to the developmental regionalism theory, the objective of regional integration concerns economic and social development. Drewnowski (1966) identifies socio-economic development with a change in the quality of life and the quantitative growth of various values. This view defines development as a process of qualitative change and quantitative growth of societies and the economy (Drewnowski 1966). Mabogunje (1980) interprets development in four terms, such as economic growth, modernisation, distributional justices, and as socio-economic transformation. Based on the reviewed studies in this study, the principal areas where the effect was measured include industrialisation, financial sector development, debt management, migration, tax revenue, capital mobility, skills distribution, trade, employment, poverty, inequality, and human development. These studies still have a limitation in that when the assessment focuses on a specific industry or area, it may be challenging to recommend and implement policies that promote regional integration. The positive or negative effect on one area may not guarantee the same effects on other sectors of

the economy. Despite this, these studies are crucial to the theoretical discussion regarding the impacts of regional integration in the development discourse.

Three critical composite studies were reviewed. This includes the research by Santos-Paulino (2015), who examined the effect of regional integration on economic development in Sub-Saharan Africa, developing Asia, Latin America, and the Caribbean areas. GDP per capita, education, inequality, investments, government expenditure, money supply as a percentage of GDP and population growth were used as indicators of socio-economic development (Santos-Paulino 2015). Eyster (2014) also assessed economic development and regional integration in EAC and South Africa. Life expectancy, infant mortality rate, population levels, adult literacy rate, FDI, inflation rates, GDP growth rates and GDP per capita were employed in measuring the relationship between regional integration and economic development (Eyster 2014).

Both quantitative and qualitative factors in development were considered. The conclusion based on these composite studies can be regarded as more useful and applicable lessons to the whole nation, not only in specific areas. Based on these studies, a true reflection of the role and importance of regional integration can be drawn.

3.4.3 Study categories, according to intervention descriptors

The reviewed studies in this empirical chapter were classified according to the category where most of the variables lie, as indicated in Table C.1, Column 4. The variables led to the grouping of studies into four main categories. The first category comprises studies that observed infrastructure and geographical factors. This category includes physical infrastructure, industrialisation, geographic location of countries, and environment-related elements. A literature review indicates that it is the least represented class based on the indicators used as variables in several studies. Only one study by Rekiso (2017) had these infrastructural and geographic factors. This indicates a lack of research focusing on additional essential indicators outside the trade area. In the case of developmental regionalism, infrastructure and industrialisation are key components.

The second group of studies focuses on trade factors that include import and export-related measures. This grouping is common in literature, suggesting that it is an active area of research (Table 4.2). Much of the studies on the effect of regional integration were biased towards trade indicators, which is the traditional view in the theory of regional integration and socio-economic development. Trade factors is a broader area, which must incorporate other measures apart from trade measures, such as total trade flows, trade diversion and trade expansion. Financial and macroeconomic factors constitute the third grouping. This category forms most of the reviewed studies in this research.

As aforementioned, the effect of regional integration seems to focus on financial integration and economic growth. The commonly used growth variables are GDP, GDP per capita, capital stock, investment levels, FDI, inflation rates, investment levels, external debts, government revenue and expenditure, and national savings. Concerning the study, this pattern of research follows the ancient days when development always focused on the economies' income rather than the people's living conditions. The study, through this empirical literature review, has discovered that the effect on economic growth is an over-researched area. The study extended to investigate the social and economic development aspect. This is an extension or a broader evaluation of the effect of regional integration impact.

The fourth category employed social and demographic factors, comprising all aspects of change in the social well-being of the population, such as population size, education, poverty, inequality, and mortality rates. This is the second least used category showing that little attention focused on regional integration on social aspects. Development cannot be concluded based on the quantitative economic aspects, without factoring in the qualitative aspects, such as standards and quality of living of the general population. Based on this theoretical divergence, the contribution of the study is to measure the influences of regional integration on socio-economic aspects.

3.5 RESEARCH METHODOLOGY

Impact assessment can be observed as both a science and art of measuring the effectiveness of activity and judging by the significance of changes brought about by

that activity. This research assessed the effect of regional integration on socio-economic development. Qualitative and quantitative techniques are useful in evaluating the changes due to various indicators used as interventions. Premised on this, this empirical literature review employed both the studies, applying quantitative and qualitative methodological approaches. The qualitative studies were reviewed for their usefulness, especially on identifying the qualities that could be used to define socio-economic development and to the broader understanding of the regional integration theory.

Quantitative studies are more useful as references on the methods and variables on how the effect can be measured and provide researchers with the ease of making conclusions. For this analysis, the methodologies were grouped into three classes, as indicated in Table 4.1 under the research strategy column. The first class represents studies that employed qualitative methods and studies in the second class used quantitative methods. Some studies relied on mixed methods and these are classified in the third class.

3.5.1 Empirics based on quantitative methods

Most reviewed studies were quantitative studies, applying statistical and econometric methods of data analysis. These quantitative studies were further divided, according to the methods of data analysis applied. Most of these quantitative studies employed panel (longitudinal) data analysis methods. Saunders et al (2012) define panel data as a combination of cross-sectional and time-series data, a collection of observations for multiple subjects at multiple instances. Panel data are famous for their ability to capture the homogeneity features of diverse countries. As a result, panel data analysis is desired when analysing the dynamics of change, especially when analysing variables or policies which have changed over some time. Panel data analyses aid the measurement of unobservable effects, such as government policies and institutional impacts, which may not be readily determined using time-series data. It has been popular amongst these studies.

3.5.1.1 Panel data (longitudinal) based techniques

Five studies employed the dynamic panel data analysis with the generalised method of moment estimator (Ahmed 2016; Muhanji & Ojah 2016; Nnyanzi et al 2016; Santos-Paulino 2015; Kamau 2010; and Muthonga et al 2013). These studies were conducted in 30 SSA countries, EAC, COMESA, EAC, SADC and EAC, respectively. Diverse variables were employed as indicators, collected in various countries at dissimilar time intervals necessitated using panel data techniques.

The econometric literature offers a wide variety of estimation methods. The information used in these methods differs, ranging from fully parameterised likelihood methods techniques to pure non-parametric methods and many others in between these two. The generalised method of moments (GMM) is a statistical method, combining observed economic data with the information in population moment conditions to produce estimates of the unknown parameters of the economic model (Hall 2005). Once those parameters are provided, inferences about the fundamental question of interest can be performed. GMM is considered more robust to model specification, as it requires less information and still may provide consistent estimates without imposing additional assumptions. This explains the increasing popularity of semi-parametric estimation frameworks, as they allow for incorporating only as many restrictions as economic theory implies. GMM is also familiar and desired in the econometric analysis because it is well-tailored to the information obtained from the presented economic models.

Four studies also employed panel data analysis, applying the gravity model estimation. They were conducted in the Europe Mediterranean region to MENA regions (Chenaf-Nicet & Rougier 2016), in the EU (Geldi 2012), NAFTA; Mercosur; AFTA (Baier & Bergstrand 2007). These studies justify using panel data since they have more than one subject (member countries). Two other studies applied the gravity model with time-series data focusing on France (Figueiredo, Lima & Orifice, 2014) and the USA (Candau & Dienesch 2015). These two studies employed time-series data since the studies observed variables based on one country over various time intervals.

The gravity model is a prevalent econometric model in international trade (Anukoonwattaka 2016). Tinberg (1962) proposed this, based on its use of the gravitational force concept as an analogy to explain the volume of bilateral trade flows. This model is popular amongst researchers because it is easy to use real data to explain trade flows concerning policy factors. It is also desired for its simplicity in using OLS. The gravity model is used to analyse predicted trade flows and observe differences between predicted and observed flows. Its application in estimating the effect of regional integration was noted to have two significant limitations. First regional integration agreements may be endogenous variables, the causal link between the formation of RTAs and the trade flows. This indigeneity has effects on the gravity-based estimates. Second, recent literature is replete with models where regional integration agreements are formed in pursuit of other non-trade goals or where they have non-traditional goals (Limao 2006). This study considered regional integration from the perspective of developmental regionalism, encompassing other objectives apart from trade.

The least commonly employed techniques in these studies that used panel data are the correlational analysis and the ARDL bounds testing cointegration analysis. A few studies applied inferential correlational analysis. Erick (2011) in EAC and Basdevant et al (2012) in the SACU region studied the relationships between regional integration on economic growth and development; and inequalities for the period 1980 to 2011. Correlational research is concerned about the statistical relationship between two or more variables without much consideration of the extraneous variables. The ARDL cointegration analysis was only applied in two studies that focused on Egypt (Eltahir 2013) and the SACU region (Manwa 2015).

Pesaran, Shin and Smith (1999) introduced the ARDL approach; it gained traction in recent times. When compared to other cointegration analysis methods, the bounds testing approach attracted many researchers' interest because both the short-run and the long-run parameters of the model specified can be estimated simultaneously (Adeniyi, Oyinlola, Omisakin & Egwaikhide 2015). Adeniyi et al (2015) further credit this approach for its applicability regardless of the order of integration, whether it is I (0) or purely I (1). Besides, ARDL is more robust and performs better for small sample sizes than other cointegration techniques.

3.5.1.2 Cross-sectional data-based techniques

Cross-section data are a collection of observations for multiple subjects, such as various countries at a single point in time. Kiyota, Brown & Stern (2007) conducted an analysis of a US-SACU Free Trade Agreement applying the Michigan Model of World Production and Trade. Venables (2003) investigated the winners and losers from regional integration agreements in the EU and ECOWAS using the factor endowment-based model. Applying models in the analysis involves identifying indicators as provided in the model and revealing their status from the case under study concerning the expected relationship. The unpopularity of cross-sectional data in the past studies of this nature could be contributed to a lack of precision on the cause and effects relationships. This is because cross-sectional data reflect only the status at a single moment in time without capturing the before and after events. Studies on the effect of regional integration are targeted at policy advisory as a result, proper influential decisions might need a survey taken extensively not just at a specific time frame.

3.5.2 Empirics based on qualitative methods

Only three of the studies employed the qualitative approach in the empirical analysis. Rekiso (2017) studied the relationship between industrialisation and regional economic integration in the SSA region. Using a contextual approach, Rekiso (2017) outlined a historical, theoretical framework to identify the patterns of intra-Africa trade. Despite being a qualitative study, this study is valuable for the research because the level of industrialisation in any country has direct implications on economic development with spillover effects on the social conditions. Therefore, if regional integration has a positive influence on industrialisation, it is also expected to positively influence the socio-economic development of a bloc or an individual country.

Akinrata (2016) observes the effect of regional economic integration and globalisation on the construction industries in South Africa. The research applied a conceptual approach, and the discussions were mainly based on exploring literature and clarifying the views of people who investigated and wrote on this field. Despite the study focusing on a specific country, it is of importance as its effect on the construction sector has implications on the economic and social well-being of the economy. The construction

industry contributes to the GDP and employment in an economy; if regional integration influences this sector, it also contributes to socio-economic development.

Chanda (2010) studied regional integration in Southern Africa, focusing on the future of SADC and SACU. Using a desktop study, Chanda (2010) reviewed theories and literature on this subject and concluded that for Southern Africa to change from LDCs to a large unit block of developed nations, integration efforts and policies are important. These findings are vital in building expectations of the study.

3.5.3 Empirics based on mixed methods

Only two of the studies, Muthonga et al (2013) and Kweka & Mboya (2004) employed the mixed methods approach in the analysis. Eyster (2014) observed economic development and regional integration in the EAC and South Africa. This study was conducted by reviewing secondary data documents on economic developments due to regional integration. Kweka and Mboya (2007) explain the relationship between regional integration and poverty using Tanzania as a case study. The mixed-methods approach was applied methods using primary and secondary data. The study employed questionnaires for primary data collection and the reviewed documents were collected, employing questionnaires. Secondary data were collected employing document reviews. The mixed-methods approach has a strength that it can be useful in research questions where neither qualitative nor quantitative can answer precisely on its own. This method is best applied in broad and complex questions, with multiple concerns. Both qualitative and quantitative analysis provide comprehensive findings.

3.6 CHAPTER SUMMARY

This chapter summarised the 31 studies, reviewed as empirical literature in this study. The common areas where the research was conducted were identified, indicating the deficiency in the SACU region. The research methodologies and the widely used indicators were discussed, indicating a lack of universally agreed to ways of measuring the effect of regional integration. Most studies were biased towards trade integration, resulting in the limited number of composite measures of regional integration. The empirical literature review also revealed a lack of research concerning the SACU region, investigating the holistic development concept. Most researchers were biased

towards the traditional economic output measures, failing to incorporate the social well-being into the development narrative.

CHAPTER 4: RESEARCH METHODOLOGY

4.1 INTRODUCTION

The previous chapter focused on reviewing the empirical literature. The purpose of this chapter is to unpack the research methodology for the present study. The main objective of this study was to assess the effect of regional integration on socio-economic development. This research is based on two strands of economic inquiry, indicating regional integration and socio-economic development, as mentioned in the literature review. For this objective to be achieved, the methodology applied is divided into two major parts.

The first section unpacks the PCA procedures used in the construction of the regional integration proxy, which is an index comprising several indicators reflecting on regional integration. The other part focuses on the panel data analysis where the OLS (LSDV), FE and random-effects models for further inquiry into the relationship. These econometric analytical techniques are used to ascertain the effect of regional integration on socio-economic development between 2000 and 2017.

This chapter begins with explaining the research approach, research strategy, sampling and type and nature of data and data sources employed in the study. Lastly, there is a description of how the data was analysed beginning with the construction of the SRII and then the testing of the relationship using the OLS (LSDV), FE and random-effects models.

4.2 RESEARCH APPROACH AND STRATEGY

This study adopts a deductive approach to research which has been widely used in scientific and social investigations. According to Babbie (2010), this approach entails dissecting, summarising and synthesising information across various sources in an attempt to test theoretical implications using an empirical investigation. Therefore, this research was guided by an extensive literature review done in the previous two chapters on the numerous regional integration theories and empirical literature. Framework documents on regional integration and socio-economic development, development plans adopted or being implemented in individual member states of

SACU and evaluation reports at country and international level have also been used to direct this analysis. A deductive approach to research searches for evidence to either approve or disapprove the hypotheses being assessed.

This research developed an SRII and used it as an indicator for regional integration and was run with the different socio-economic variables to obtain the evidence to support or reject the hypotheses. The OLS (LSDV), FE and random-effects modelling were employed to verify the effect of regional integration on socio-economic development in the SACU countries.

Concerning research strategy, quantitative techniques and econometric panel data techniques were employed to measure the effect of regional integration on socio-economic development. The quantitative approach allows for the measurement of effect by examining changes across the variables of interest over time. Panel data techniques were useful. Each year in each country under study provides a different cross-sectional observation of the effect on socio-economic development of the engagement in regional integration. Hence, using panel data enriches the overall findings as the cross-sectional values are jointly analysed over time. Manwa (2015) notes that the assumptions of homogeneity across test samples may pose a drawback to the panel data approach such that researchers must be careful when concluding because of the heterogeneous nature of each economy under study.

4.3 DATA, SOURCES AND ANALYSIS

The secondary panel data ranging from 2000 to 2017 on each indicator was collected from all the five SACU member states, indicating Botswana, Eswatini, Lesotho, Namibia, and South Africa. Data were collected from the United Nations Commodity Trade Statistics (UNCT) database, International Trade Centre (ITC), SACU statistical databases and the individual countries statistical offices databases. Sources in the public domain aids to reliability and validity of the study as they reduce bias established in private subjectively collected data (Moyo 2014). Due to the complexity of the investigation, involving several approaches, the data collected were analysed using several statistical packages. These statistical packages included Microsoft Excel, which was employed for data normalisation in developing the SRII index. Second,

Stata 13 econometric package was used to run the PCA and assigning weights and aggregating indicators into a single index and the pooled OLS, fixed and random-effects models.

4.4 CONSTRUCTION OF THE SACU REGIONAL INTEGRATION INDEX (SRII)

Regional integration is viewed as a complex field of study in literature. The empirical literature review conducted in this study revealed that most studies were biased towards regional economic integration, trade liberalisation, and financial markets integration. In these focus areas, the variables commonly used to measure regional integration were:

- average tariffs
- trade ratios
- trade openness
- exports
- imports
- terms of trade
- financial openness
- exchange rates
- multilateral trade
- domestic trade inflows
- international trade inflows
- the average applied statutory tariff rates
- average applied collected tariff
- total tariff revenue as a per cent of GDP

As alluded to in the previous chapter, this trend follows shallow integration, which is the agreement to allow free movement of goods, services and factors of production leading to trade diversion and trade creation effects. The variables employed only indicated how trade had been made easier amongst the member states.

Conversely, later researchers, including De Rosa and Govindan, (1996) and Nnyanzi et al., (2016) argued for development integration which demands a more stable

intervention by the state than a mere market integration. This is part of the deeper integration which encompasses political, financial, and economic reforms other than just the removal of border restrictions. This will assist the countries involved to enhance the implementation of policies to address significant causes of market failure, such as the unequal distribution of benefits amongst the member states (McCarthy 1997). With this noted limitation of the shallow definition, the study takes the broader sense of regional integration borrowing from modern theories, such as deep integration and developmental regionalism.

Regional integration in this study is measured, employing a composite regional integration index constructed by the researcher. The constructed index builds on motivations, aspirations, dimensions, indicators, and methodologies from composite indices developed before. The ARII (UNECA 2016) is the more closely related index which the study borrows dimensions and indicators. This index was developed by the AUC, the AfDB and the Economic Commission for Africa (ECA). The ARII index covered only those countries who belong to the eight blocks recognised by the AU. Member countries from the eight regional economic communities (RECs) recognised by the AU[1]. Other indices closely related to the SRII concerning methodology are the APRII, EURII) and the RII for the Arab world countries.

The Development Bank of Asia developed the APRII in 2017. It was designed as a tool for assessing the degree of integration on different socio-economic dimensions across the 48 countries and six sub-regions of the Asian- Pacific region. EURII is applied to the members of the EU. The EU integration index was the first instrument designed to measure the level of economic integration on the members of the EU. It also enabled the ranking of members regarding their levels of integration in the EU (Konig & Ohr 2013). The PCA technique was applied in the construction of the EU index. The Regional Integration Index for the Arab world was the first one constructed. by the United Nations Economic and Social Commission for Western Asia (UN-ESCWA) developed this in 2006. According to the United Nations (2016), Arab

[1] These RECs are: CEN-SAD, COMESouth Africa, EAC, ECCAS, ECOWAS, IGAD, SADC & UMA

countries are classified as concerning their contribution to regional economic integration. This index, like the one for EU countries, also employed the PCA method.

4.4.1 SACU RII composition and data description

The SACU Regional Integration Index (SRII) was constructed by adopting the ARII'S dimensions and indicators. In this study, the RII comprise of additional variables apart from the trade variables focused on in all reviewed studies. This index comprises variables under four selected dimensions from five used in ARII, such as the regional infrastructure, trade integration, productive integration, free movement of people; and financial and macroeconomic integration as presented in Table 4.1. The broadness and comprehensiveness of the index make it a suitable proxy for regional integration in this study as it covers more factors, affecting the socio-economic well-being of the citizens of the countries in the region.

By analysing the relationship in the SACU region using such a comprehensive proxy, the effect can increase in all five countries compared to what Manwa (2015) established using only a few trade-biased variables as proxies for regional integration measured for 31 years. This index can help evaluate the extent to which the member states have integrated based on each dimension selected, comparing the areas of strengths and weaknesses for informed decision-making or policy recommendations. As expressed in the UN (2016), the SRII also intends to assist with identifying niches and weaker areas to direct the policymakers on best practices to maximise the benefits from regional integration.

4.4.1.1 Dimensions and indicators

The SRII adopts the dimensions and indicators from the ARII (2016). It comprises five dimensions of regional integration. This choice was motivated by the comprehensive ARII dimensions, appropriate in the modern developmental and in-depth integration perspective. The SACU index is constructed using only 14 indicators instead of all 16 due to the unavailability of data on the other two indicators under the regional infrastructure dimension. These two omitted indicators were:

- the average costs of roaming within the region

- the proportion of flights within the region

The two variables' absence would not compromise this dimension because the other indicator under this dimension is the AfDB Infrastructure Development Index. This indicator is comprehensive. It includes transport, communications, water, electricity, and sanitation measures. In the construction of the AfDB index, nine indicators influencing the levels of productivity and economic growth are considered (UNECA, 2016). The dimension is well represented, even without the two variables, whilst the outcome is unaffected.

Table 4.1: SACU Regional Integration Index dimensions and indicators

Dimension	Indicator	Indicator description	Sources of data
1.Trade Integration	1a. Levels of customs duties on intraregional inputs	This indicator measures the weighted average of tariffs applied as a percentage of the total of intraregional imports for all the products identified.	SACU annual reports (2010, 2013, 2017) state that there are no customs duties charged on intra-regional imports.
	1b. share of intraregional goods exports (% of GDP)	This indicator measures the value of intraregional goods exports as a percentage of the country's GDP per year per country.	SACU statistical databases http://www.sai.int (accessed March 2019) United Nations, Commodity Trade Database http://comtrade.un.org/ (accessed Feb 2019)
	1c. share of intraregional goods imports (% of GDP)	This measures the value of intraregional imports as a percentage of GDP per year per country	SACU statistical databases http://www.sai.int (accessed March 2019) United Nations, Commodity Trade Database http://comtrade.un.org/ (accessed Feb 2019)

	1d. share of intraregional goods trade (% of intra-REC trade)	This measures the country's intraregional trade as a proportion of the total intraregional trade of the SACU region per year per country	SACU statistical databases http://www.sai.int (accessed March 2019) United Nations, Commodity Trade Database http://comtrade.un.org/ (accessed Feb 2019)
Regional infrastructure	2a.Infrastructure development index	The indicator is based on four main categories: Transport; electricity ICT; water and sanitation. These categories are divided into nine indicators having a direct or indirect effect on productivity or economic growth. The indicator is calculated by the AfDB	Africa Infrastructure Development Index (AIDI, 2019) http://www.afdb.org/(accessed March 2019)
	2b. Total regional electricity trade (net) per capita (absolute value)	This measures the proportion of the annual volume of regional electricity imports minus the annual volume of regional electricity exports, as an absolute value to the population of each country per year	World and regional data statistics http://www.knoema.com/world data atlas/infrastructure-electricity trade (accessed February 2019)
Productive integration	3a. Share of intraregional intermediate goods	Percentage of intraregional exports of intermediate goods compared to the total of intraregional goods exports	SACU statistical databases http://www.sai.int (accessed March 2019)

	exports (% total intraregional goods exports)		United Nations, Commodity Trade Database http://comtrade.un.org/ (accessed Feb 2019)
	3b. Share of intraregional intermediate goods imports (% total intraregional goods imports)	Percentage of intraregional imports of intermediate goods compared to total intraregional goods imports	SACU statistical databases http://www.sai.int (accessed March 2019) United Nations, Commodity Trade Database http://comtrade.un.org/ (accessed Feb 2019)
	3c.Merchandise trade complementarity index	UNCTAD calculates this indicator. It measures the total absolute value of the difference between the index of the share of imports and the index of the share of exports compared to other SACU member states	UNACTAD Merchandise Trade Complementarity Index http://dataportal.opendataforafrica.org/vzcmiff/merchandise-trade-complementarity-annual-1995-2018
Free movement of people	4a. Ratification by the country of REC protocol on the free movement of people	This qualitative indicator measures whether the country has ratified the protocol on the free movement of people in the REC of which it is a member. Ratification: Yes = 1; No = 0	SACU policy documents. None of the SACU countries has ratified the SACU protocol on the free movement of people in the region.

	4b. Proportion of REC member countries where nationals' may obtain a visa on arrival	Many other member countries where citizens do not require a visa, as a percentage of the total number of SACU countries membership minus one	SACU policy documents. No visas are required from member countries when travelling around the region.
	4c. Proportion of REC member countries where nationals may obtain a visa on arrival	Many other countries where nationals may obtain a visa at the country's airport, as a percentage of the total number minus one of the member countries	SACU policy documents. No visas are required from member countries when travelling around the region.
Financial integration and convergence of macroeconomic policies	5a. Regional convertibility of national currencies	This indicator measures the number of countries of the region with which the country shares a common currency or with which its currency is convertible	CMA policy reports (2016) Four of the five SACU countries' currencies exchange at 1:1 rate. Botswana is the only country that trades at a rate higher than 1: 1.
	5b. Inflation rate differential	The inflation rate differential is the difference between the inflation rate of the country and the annual regional average based on the consumer price index	World and regional data statistics http://www.knoema.com/world data atlas/inflation

AfDB (2015) reports the AIDI, comprising the following four major components:

- Transport component index spelt by two indicators which are the total paved roads in (km per 10 000 inhabitancies) and the total road network in km (per km^2) of exploitable land area
- The electricity index component which is measures by the net generation in (KWh per inhabitant)
- ICT composite index, which has four indicators; total phone subscriptions (per 100 inhabitants), fixed-line telephone subscriptions (% population), mobile cellular subscriptions (% population), fixed wired broadband internet subscribers (per 100 inhabitants), International Internet Bandwidth (Mbps) and the number of internet users (per 1000 inhabitants)
- Water and sanitation index component observing Improved water source (% of the population with access) and Improved sanitation facilities (% of the population with access)

Concerning the composition of the AIDI presented, using the AIDI as a variable provides confidence that the infrastructure component is captured fully for all the countries under study. It is even a broader measure such that the unavailability of data on roaming and electricity will not be considered an issue compromising the output. The annual data on AIDI is available for all the SACU countries from 2000 in the AfDB database.

4.4.2 Methods of constructing the SRII

This study desired to produce the composite indicator for its strength in pulling different integration dimensions together and therefore making it possible to view the trend and quickly assess regional integration progress. On the one hand, it is also easy to communicate and helps simplify comparisons between countries as required in this study. On the other hand, a composite indicator can be regarded as a simple interpretation of the progress in the dimensions under study. All the methods possible on the selection and weighting of individual indicators have their strengths and weaknesses. Learning from the selective audit by Gor (2017) on the methodology for ARII, this study adopted a different method of weighting the various indicators in the

composite index. The methods are organised in steps starting with selecting variables, data normalisation, weighting and aggregating. The next section outlines how data was normalised in this study.

4.4.2.1 Data normalisation

This is applied in cases where indicators were used to convey various quantitative information are not in proportion with others and have different measurement units. This necessitated the normalisation process on the collected panel data (see Appendix A) before the aggregation process. Various methods are available each with its pros and cons. One way that could be used is the z-scores technique. This is performed by subtracting the average and dividing by the standard deviation. This method is the most basic way but may not be applicable in all cases, especially in this study where comparisons of different cases are needed. In this study, comparisons are required across the five SACU countries and over the 18 years under investigation to draw conclusive results.

Another normalisation method could be to combine the datasets and use the distance to best performer approach. Still, data skewness and the effect of extreme values would compromise the outcomes. In this study, the min-max rescaling was used. This method has been used in several other indicators including the ARII, APRII and the HDI. An advantage of this method is that comparisons across countries over some time are possible. This procedure standardises the variables to range between 0 and 1 in measurement and with this, the higher the value, the more the level of integration.

To normalise the data, the min-max method formula was applied as follows:

$$(observed\ min - data \min value)/(\ data \max value - data \min value) * (1 - 0) + 0$$

Where the observed min is the actual value of the indicator on that specific point in time. The data min value is the minimum value across the indicator data set, and the data max value is the maximum value across the indicator data set over the observed period. The formula is based on standard normal density function, where the assumption of normality, normal distribution should have a mean of 0 and a variance of 1. The component (1-0) + 1 in the formula puts a restriction on the data from exceeding 1, meaning the normalised data should not exceed 1. Doing this reduces

too much variability in the dataset. The above formula was applied to the collected panel data, and the normalised data are presented in Appendix B.

4.4.2.2 Aggregation scheme: PCA method

Typically, or motivated by data having indicators grouped under four different dimensions, several methods could be used in assigning weights. One option could be assigning equal weights as in the ARII (UNECA, 2016) and the social capital index by Putman (2000). The use of equal weights was based on the argument that all the dimensions were of equal importance to the matter. They would not allocate any to be superior to the other. Another approach could be using the researcher's judgement or consulting from the experts and applying their opinions. This is called subjective weighting.

For this study, the experts were consulted, and no consensus on the best method was reached. The dimensions and respective indicators in the SRII were presented at a seminar held at the University of Namibia for the Economic and Management Sciences Faculty. The proposal was presented, and opinions were sought as to how the various indicators could be treated. Second, the draft index was presented at a training conference held in Dakar, Senegal in 2019. The training was on using the ARII. The main idea arising was that within the SACU region, all the four dimensions included were not balanced in practice. There are dimensions, such as trade integration, which is mostly dominant concerning defining regional integration in SACU. The other approach applies statistical methods, such as the PCA, applied by the APRII (2017). The PCA is adopted mainly because of its objectiveness. The analytical methods have no prior assumptions on the weights implying that using statistical approaches is more objective, based on practical applications (Booysen 2002).

On the aggregation of the indicators, the five dimensions provided have an unequal number of indicators and continue to be revised. For instance, trade integration used to have four indicators and now is represented by three indicators. The same applies to productive integration that used to have three but is now represented by two indicators. On the free movement of people dimension, there were three indicators. In the SRII the dimension is represented by none. It is, therefore, not considered. In the

other two dimensions, regional infrastructure has two indicators and financial and economic policies had two indicators but was represented by one. This odd number of indicators may pose a challenge in that the dimensions grouping with more indicators relative to other dimensions, will weigh more than others and eventually create an imbalance in the structure of the composite index (OECD 2008). To eliminate this challenge, this study assigned the weights to each indicator following the PCA method. The PCA method was recommended for its objectiveness, elimination of repetition and use of correlated variables.

Zaiontz (2014) describes the PCA as a statistical tool that can be used to summarise the variables into principal components without losing a great deal of information. The PCA is a variable reduction technique applied when variables are closely related to lower them to representatives, called the principal components. Hur and Park (2017) recommend it as the most applied statistical method in the construction of the composite index. Gwartney and Lawson (2001) uttered that the PCA only applies in cases where each dimension is based on various aspects of the composite index. The OECD (2008) recommends the same method as the most useful tool amongst the currently available weighting schemes, especially when the dimensions have a smaller number of indicators (from 0 to 10).

In this study, the normalised data set for the nine variables left were analysed, employing the PCA. When using PCA, a correlation matrix, indicating eigenvalues, is indicated as an outcome. The eigenvalues indicate the variance explained by each principal component or each factor. This study applies a standardised basis for selecting the principal components, which will provide a small difference with the actual set of variables. The basis is defined in such a way that each principal component should explain at least 5% of the variance. The cumulative variance of the chosen PCs is at least 75%, and the eigenvalue of each PC selected is above one. This ensures that it can explain as much variance as the one explained by one variable on the diagonals of the correlation matrix. The PCA observes the variables with a linear relationship from the nine original ones, with the maximum variance of principal components as presented in Equation 4.1 to 4.4 below.

The data vector comprises nine variables which are:

$$X = (X1, X2, X3, X4, X5, X6, X7, X8, X9)$$

Let the principal components, $PC = (PC1, PC2, PC3, PC4)$ be defined as :

$$PC1 = \alpha 1X = \alpha 11X1 + \alpha 21X2 + \cdots \ldots \ldots \ldots + \alpha 91X9 \quad 4.1$$

$$PC2 = \alpha 2X = \alpha 12X1 + \alpha 22X2 + \cdots \ldots \ldots \ldots \ldots + \alpha 92X9 \quad 4.2$$

$$PC3 = \alpha 3X = \alpha 13X1 + \alpha 23X2 + \cdots \ldots \ldots \ldots \ldots + \alpha 93X9 \quad 4.3$$

$$PC4 = \alpha 4X = \alpha 14X1 + \alpha 24X2 + \cdots \ldots \ldots \ldots \ldots + \alpha 94X9 \quad 4.4$$

The coefficients α_{ij} stands for the weights for the I^{th} variable and the j^{th} principal component and $\sum_{i=1}^{4} \alpha^2{}_{i1} = \sum_{i=1}^{4} \alpha^2{}_{i2} = \sum_{i=1}^{4} \alpha^2{}_{i3} = \sum_{i=1}^{4} \alpha^2{}_{i4} = 1$ 4.5

The data vector X has the correlation matrix eigenvalue-eigenvector combinations where the eigenvalue ($\lambda_1 \geq \lambda_2 \geq \lambda_3 \geq \lambda_4$). The eigenvalue provides the variance for each principal component. Accordingly, the eigenvector, following the largest eigenvalue (α_l) determines the eigenvector, which will be providing their respective weights(α_{ij}). The first principal component PC1= α_l X explains the most significant variation in the data. All other principal components (PC2, PC3, and PC4) are constructed using the eigenvector corresponding the second, third and fourth-largest eigenvalues, respectively. Each PC was orthogonal to the previous PC, explaining additional but less variation than the ones before. Orthogonality of the PCs implies that if a component changes, it will not disturb the other components, which is a crucial characteristic desired when designing composite indexes.

4.4.2.3 Generation of weights

The principal components selected are assumed to be sufficient to characterise the data variation. To generate a composite index, the principal components squared loadings for each variable are multiplied with the values of the normalised variables and their sum becomes the index. The loadings are the correlation coefficients between the variable X and the principal component. These loadings on the

components are a direct ranking of the relevance of each variable. The loadings are provided as:

$$\text{Corr}(X_i\ PC_j) = \sigma_{ij} = e_{ij}\sqrt{\lambda_j},\ I = 1, 2\ldots\ldots,9 \text{ and } j=1,2,3,4.$$

The loadings, σ_{ij}, are then squared (σ_{ij}^2) to represent the proportion of variance in variable X explained by the component PC. Since,

$$\sum_{i=1}^{4} \alpha^2{}_{i1} = \sum_{i=1}^{4} \alpha^2{}_{i2} = \sum_{i=1}^{4} \alpha^2{}_{i3} = \sum_{i=1}^{4} \alpha^2{}_{i4} = 1\ from\ eq\ 4.5$$

The sum of squared loadings of PC_1, PC_2, PC_3, PC_4 is $\lambda_1 + \lambda_2 + \lambda_3 + \lambda_4$ which are the variances of PC_1, PC_2, PC_3, PC_4, respectively. The squared loadings (δ) are then normalised to unity sum by dividing them with their respective sums, such as $\sigma_{ij}^2 / \lambda_j$. The weights are then calculated as:

$\theta_j = \lambda_j / (\lambda_1 + \lambda_2 + \lambda_3 + \lambda_4)$ where j = 1, 2, 3, 4 to quantify the portion of explained variance in the data when considering the selected principal components only.

θ_1, θ_2, θ_3 and θ_4 are the weights assigned to the respective principal components to calculate the overall weights to be used in the index calculation as follows:

$$w_1 = \delta_{11}\theta_1 + \delta_{12}\theta_2 + \delta_{13}\theta_3 + \delta_{14}\theta_4\ 4.6$$

$$w_2 = \delta_{21}\theta_1 + \delta_{22}\theta_2 + \delta_{23}\theta_3 + \delta_{24}\theta_4\ 4.7$$

$$w_3 = \delta_{31}\theta_1 + \delta_{32}\theta_2 + \delta_{33}\theta_3 + \delta_{34}\theta_4\ 4.8$$

$$w_4 = \delta_{41}\theta_1 + \delta_{42}\theta_2 + \delta_{43}\theta_3 + \delta_{44}\theta_4\ 4.9$$

$$w_5 = \delta_{51}\theta_1 + \delta_{52}\theta_2 + \delta_{53}\theta_3 + \delta_{54}\theta_4\ 4.10$$

$$w_6 = \delta_{61}\theta_1 + \delta_{62}\theta_2 + \delta_{63}\theta_3 + \delta_{64}\theta_4\ 4.11$$

$$w_7 = \delta_{71}\theta_1 + \delta_{72}\theta_2 + \delta_{73}\theta_3 + \delta_{74}\theta_4\ 4.12$$

$$w_8 = \delta_{81}\theta_1 + \delta_{82}\theta_2 + \delta_{83}\theta_3 + \delta_{84}\theta_4\ 4.13$$

$$w_9 = \delta_{91}\theta_1 + \delta_{92}\theta_2 + \delta_{93}\theta_3 + \delta_{94}\theta_4 \quad 4.14$$

4.4.2.4 The final composite index calculation

The calculated weights were based on the loadings of the principal components; each variable was then multiplied with the normalised panel data set of the original variables in the linear combination as follows to produce the index:

$$\text{SRII} = w_1X_1 + w_2X_2 + w_3X_3 + w_4X_4 + w_5X_5 + w_6X_6 + w_7X_7 + w_8X_8 + w_9X_9 \quad 4.15$$

The SRII generated per country is the data used as the dependent variable, which is a representing regional integration as a proxy for regional integration. This variable was analysed with the socio-economic variables selected using the methods to be discussed in the next section to conclude on the influence.

4.5 ANALYSIS OF THE IMPACT OF REGIONAL INTEGRATION AND SOCIO-ECONOMIC DEVELOPMENT

The thrust of this study was to assess the effect of regional integration on socio-economic development. To achieve this objective, an econometric analytical technique was applied to panel data, based on the five countries covering the period from 2000 to 2017. This method allowed for the joint analysis of the cross-sectional data over the period producing rich and more robust results to conclude on the effect of regional integration on socio-economic development in the region. This section begins with explaining the sampling and type and nature of data used. The next section describes the data analysis starting with the panel unit root tests for data stationarity. Then a more in-depth review of the LSDV technique, the fixed and random-effects models applied in this study.

4.5.1 Sampling and data

This study employs panel data for SACU countries, which include Botswana, Lesotho, Namibia, Eswatini and South Africa. The study covers the sample period from 2000 to 2017, therefore generating a balanced stacked panel of 90 observations (period = 18

and across five countries). The choice of the period under study was mainly influenced by following the notable developments of attainment of Namibia's independence in 1990 and the ending of apartheid in South Africa in 1994. SACU member countries entered new negotiations leading to the new SACU agreement of 2002. This agreement attended to issues of enhancing equal participation by members, the new revenue sharing formula and the need to develop strategies that would strengthen their integration without jeopardising the economies of the smaller economies. This makes it worth investigating the progress this integration has made in developing the nations socio-economically. Another crucial motivation is that much of the intra-SACU statistical data primarily on the variables of interest are available from 2000. The choice of variables is based on literature and the availability of data. The socio-economic variables are presented in Table 4.2. The variable definition and sources are summarised in Table 4.2.

Table 4.2: Variables descriptions and sources

Variable	Code	Definition	Source
SACU Regional Integration Index	SRII	Composite index proxy to regional integration	Constructed by Author for the years 2000 to 2007
Real GDP growth rates	RGDPG	This is Real GDP by economic activity at constant prices. The growth rate is the percentage change in real GDP from year to year	www.sacu.int/stat. Accessed March 2019
GCFG rates	GCFG	comprises outlays on additions to the fixed assets of the economy plus net changes in the level of inventories	countries' national statistical offices
Inequality Why the Gini Index	Gini	Gini index measures the extent to which the distribution of income or consumption expenditure amongst individuals or households within an	www.hdr.undp.org/en/data/human development index. Accessed March 2019

		economy deviates from a perfectly equal distribution	
Human Development Index	HDI	HDI is a summary measure of average achievement in key dimensions of human development: a long and healthy life, being knowledgeable and have a decent standard of living	www.hdr.undp.org/en/data/human development index. Accessed March 2019
Poverty levels	POV	National poverty headcount ratio is the percentage of the population living below the national poverty lines	www.hdr.undp.org/en/data/human development index. Accessed March 2019

Data were obtained from the SACU statistical database, the United Nations database of income inequalities and human development and national statistical offices, implying desktop data extraction as a data collection method.

4.5.2 Unit-roots tests

Testing for stationarity is prerequisite to ensure that the estimated parameter of interest and trends in data are avoided to eliminate the possibilities of spurious correlation and biased estimators. The spurious correlation amongst variables implies there exists a positive or negative relationship between the variables in a regression equation when, in fact, the relationship is non-existent. Literature was always critical of the inability of the standard regression technique, such as ordinary least squares to detect and account for trend or non-stationary data.

Spurious results are usually found, characterised by the coefficient of determination (R-squared) approximating a unity, high *t* and *F*-statistic that appear significant and valid but have probability values greater than 0.05 level). Gujarati (2004) infers that spurious results, such as described above often yields false inferences, indicating a relationship to exists between two unrelated non-stationary series. If a variable is stationary, it does not have unit roots, it is said to be integrated of order zero *I (0)*. If a variable is not stationary in its level, but stationary in its first differenced form, it is said to be integrated of order one*, I (1)*. More generally, the series X_t will be integrated of

order d, X_t- I(d), if it is stationary after being differenced d times, so X_t contains d unit-roots (Dickey & Fuller, 1981).

In this study, unit root test for panel data was done using the Lewin, Lin and Chu (LLU) approach to determine whether the series is stationary or non-stationary to ensure avoid the presentation of spurious results.

4.5.2.1 The Levin, Lin, and Chu (LLU) test

Empirical literature, Levin & Chu (2002), Pesaran, Shin & Smith (2001) state that panel methods for units and cointegration are based on methods developed for a single time series, on the assumption that T → ∞. Their advice is considered in this study. They advise that if the number of observations is small, being less than ten (N is small, such that N < 10), then seemingly unrelated equation methods can be used; when N is large, the panel aspect becomes more important.

This argument invokes the complications that include the need to control for cross-section unobserved heterogeneity when N is large, an asymptotic theory that can vary with exactly how N and T both to go to infinity and the possibility of cross-section dependence. It is also argued that statistics that exhibit non-normal distributions for a single time series can be averaged over cross-section to obtain statistics with a normal distribution. Unit root tests can have low power. Panel data may increase the power because of having time series for several cross-sections. Cameron and Trivedi (2010) suggest that unit root tests are relevant to consequent considerations of cointegration. For clarity, a dynamic model with cross-section heterogeneity is expressed as follows:

$$y_{it} = \rho_i y_{i,t-1} + \emptyset_{i1}\Delta y_{i,t-1} + \ldots + \emptyset_{pi}\Delta y_{i,t-pi} + z'_{it}\gamma_i + u_{it} \quad 4.4.1$$

Where the lagged changes are introduced so that error term (u_{it}) is identical, independent distributed (i.i.d).

By disaggregation, examples of z'_{it} include:

individual effects $[z'_{it} = (1)]$,

individual effects and individual time trends $[z'_{it} = (1t]$,

and $\gamma_i = \gamma$ in the case of homogeneity.

Therefore, a unit root test of H_0: $\rho_1 = \ldots \rho_N = 1$.

The expression in Equation 4.4.1 is to represent the unit root process based on the available data. Usually, the null hypothesis is that the series contains a unit root, and the alternative is that the series is stationary. In this analysis since the GMM was not applied, it was, therefore, important to use the panel unit root process. In this study, the approach of Levin, Lin and Chu (LLC) is applied. The postulation of Levin, Lin & Chu (2002) allows testing the null hypothesis against the alternative of homogeneity, such that H_a: $\rho_1 = \ldots \rho_N < 1$, based on pooled OLS estimation using specific first-step pooled residuals, wherein both steps homogeneity ($\rho_i = \rho$ and $\emptyset_{ik} = \emptyset_k$) is imposed.

Contrary to Levin, Lin & Chu (2002), Im, Pesaran, Shin & Smith (2001) instead test against an alternative of heterogeneity, such that H_a: $\rho_1 < 1, \ldots, \rho_{N0} < 1$ for all fraction $\frac{N_0}{N}$ of the $\rho_1$by averaging separate augmented Dickey-Fuller tests for each cross-section. In unison, both test statistics are asymptotically normal, and both assume $N/T \rightarrow 0$ so that the time-series dimension dominates the cross-section dimension. The panel-based unit root test proposed in this article allows for individual-specific intercepts and time trends. The error variance and the pattern of higher-order serial correlation are also permitted to vary freely across individuals. To compute the panel test statistics, pool all cross-sectional and time-series observations to estimate the following equation:

$$\tilde{e}_{it} = \delta \tilde{v}_{it-1} + \tilde{\varepsilon}_{it,} \quad 4.4.2$$

Based on a total of $N\tilde{T}$ observations, where $\tilde{T} = T - \bar{p} - 1$ is the average number of observations per individual in the panel, and $\bar{p} = \frac{1}{N}\sum_{i=1}^{N} p_i$ is the average lag order for the individual ADF regressions. Now the conventional regression *t-statistic* for $\delta = 0$, is expressed by the following:

$$t_\delta = \frac{\hat{\delta}}{STD(\hat{\delta})} \quad 4.4.3$$

Where:

$$\hat{\delta} = \frac{\sum_{i=1}^{N}\sum_{t=2+p_i}^{T}\tilde{v}_{it-1}\tilde{e}_{it}}{\sum_{i=1}^{N}\sum_{t=2+p_i}^{T}\tilde{v}_{it-1}^{2}} \quad 4.4.4$$

and

$$STD(\hat{\delta}) = \hat{\sigma}_{\hat{\varepsilon}}\left[\sum_{i=1}^{N}\sum_{t=2+p_i}^{T}\tilde{v}_{it-1}^{2}\right]^{-1/2} \quad 4.4.5$$

$$\tilde{\sigma}_{it}^{2} = \left[\frac{1}{NT}\sum_{i=1}^{N}\sum_{t=2+p_i}^{T}\left(\tilde{e}_{it} - \hat{\delta}\tilde{v}_{it-1}\right)^{2}\right] \quad 4.4.6$$

The Levin-Lin-Chu test for unit root is founded on the null hypothesis that assumes that the panel series contains a unit root, and the alternative is that the series is stationary. As explained in the previous paragraph, the Levin-Lin-Chu test assumes a common autoregressive parameter for all panels. This test, therefore, does not allow for the possibility that some countries' real gross domestic product per capita contain unit roots, whilst other countries' real GDP does not (Cameron & Trivedi 2010).

In Stata, each test performed by the command (xtunitroot), this command explicit the assumed behaviour of the number of panels and periods. The Levin-Lin-Chu test with panel-specific means, but no time trend requires that the number of periods grows more quickly than the number of panels, so the ratio of panels to periods tends to zero. The test involves fitting an augmented Dickey-Fuller regression for each panel; we requested that the number of lags to include be selected based on the AIC with at most eight lags. To estimate the long-run variance of the series, xtunitroot by default, employing the Bartlett kernel, using eight lags as selected by the method proposed by Levin, Lin, and Chu (2002).

Section 4.4.2 augments the standard practice applied to the time dimension of the time-series data set. To account for the time-series trends in the model of the data generating process this is necessary, if the values are non-stationary then the model results are not consistent and robust.

4.5.3 The empirical modelling of fixed effects -pooled OLS (LSDV), fixed and random effects

This section briefly explains the methodological approaches to panel data analysis. Baltagi (2008) define panel data as the procedural approach of forming a pool of observations on a cross-section of different economies, households, and business entities over several periods. In this study, data of the five SACU countries covering the period 2000 to 2017 is pooled together for this analysis to form a data set with ninety (90) observations. The data were analysed through OLS (LSDV), FE and random-effects modelling.

4.5.3.1 Fixed effects modelling

Proponents of panel data analysis such Baltagi (2008) and Greene (2008) infer that fixed effects (FE) approach is most applicable in cases where the researcher concerns studying the effect of variables that change over time. It assesses the relationship between the determinant factor and the dependent variable within the analysis. It is assumed that each country may be having some distinct characteristics that may hinder the effect of the determinant factor. For example, policy options pursued by a country may influence business practices of domestic companies and their investment options. In applying FE, the holding assumption is that each of the countries under study has something that can cause a bias or effect on the determinant or the determining variable, therefore, the biases should be controlled. Baltagi (2008) refers to FE as the whole reasoning behind the correlation assumption between the country's error term and the determinant variables.

The FE approach has the advantage of eliminating the effect of those variables, which do not vary with time so that the net effect of the determinant variables on the dependent outcome can be assessed robustly. Another most appealing assumption of the FE model is those factors, which do not vary with time, are different across the member states and do not correlate with the other countries' characteristics. Like in most econometrics analysis, if the error terms are correlated, similarly, applying FE supports weaker or no robust inferences since such inferences would be spurious. Meaning the researcher should opt to use REs approach to model that relationship.

The Hausman test provides the rationale for guidance in determining which approach, either the FE or the REs is best (Greene 2008).

It is argued that the FE model helps to avoid bias in the estimated coefficients emanating from the omitted time-invariant variables by controlling for their differences across countries. There is a distinguishing shortcoming of the features of FE models they cannot uncover the time-invariant causes of the determined outcome variables. Greene (2008) commends that technical wise, those characteristics in individual countries that do not vary with time are in perfect collinearity with the country dummies. Kohler and Kreuter (2009) infer that substantively, FE models are formulated to discern the causes of changes within the countries because the time-invariant variable is constant throughout the countries. It, therefore, cannot be the source of change.

The equation representing the FE model is as represented in equation 4.4.7:

$$Y_{it} = \beta_1 X_{it} + \alpha_i + u_{it} \quad 4.4.7$$

Where:

α_i $(i = 1 \ldots . n)$ is the unknown intercept for each country (n country-specific intercepts)

Y_{it} is the dependent variable, where *i* = country and *t* = time.

X_{it} represents the independent variables, where *i* = country and *t* = time.

β_1 is the coefficient for the independent variable and,

u_{it} is the error term.

In panel cross-sectional data, the beta coefficients are interpreted as: “for a given country, as X varies across time by one unit, Y increases or decreases by β units” (Baltagi 2008:46). Greene (2008) proposes another formulation of the FE model to capture the binary variables. Meaning the equation for the fixed effect model becomes:

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \cdots + \beta_k X_{k,it} + \gamma_2 E_2 + \cdots + \gamma_n E_n + u_{it} \quad 4.4.8$$

Where:

Y_{it} is the dependent variable, where *i* = entity and *t* = time

X_{it} represents independent variables,

β_k is the coefficient for the independent variable,

E_n is the entity n. Since they are binary, they assume values of 0 and 1, there are n -1 entities included in the model,

γ_n is the coefficient of binary regressors and,

u_{it} is the error term.

Both equations are similar, the coefficient of the slope on X is equal across the countries. The country-specific intercepts in Equation 1 and the binary regressors in Equation 2 come from the unobserved variable Z, which varies across the countries but not over time (Stock & Watson 2007).

Adding time effects to country-specific effects model cause a time and country fixed effect regression model, which can be represented as follows:

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \cdots + \beta_k X_{k,it} + \gamma_2 E_2 + \cdots + \gamma_n E_n + \emptyset_2 T_2 + \cdots \emptyset_t T_t + u_{it} \quad 4.4.9$$

where:

- $Y_{it,} X_{it}, \beta_k, E_n, \gamma_n \; and \; u_{it,}$ are defined as above in Equation 1 and 2, respectively
- $T_t$is the time, a binary variable (dummy), meaning there are t -1-time periods
- $\emptyset_t$ is the coefficient for the binary time regressors

Baltagi (2008) and Greene (2008) agree that controlling for time effects whenever unexpected variation or a special event occurs, may affect the model outcome. The FE with dummy variables (LSDV model on FE) provides a perfect means to grasp the FE. The addition of a dummy variable to each country helps the researcher to estimate with specificity the real effect of the independent variables through the control over the unobserved heterogeneity. Therefore, this each added dummy is absorbing the country-specific effects.

4.5.3.2 Random-effects model

The foundation of the random-effects approach is based on the rationale that there is randomness in the variation across the countries. They are not correlated to any of the determinants in the model. The main difference between the REs and the FE is whether the unobserved country-specific effects contain elements correlated with the regressors in the model (Greene 2008). As stated earlier, the advantage of the Random effect (RE) model is in its ability to include the time-invariant variable in the parameter estimation. RE application is conclusive when a researcher strongly believes the heterogeneity in characteristics across countries has a notable effect on the outcome variable. A sufficient condition to account for is that the REs model includes those variables that do not change with time, such as gender and race, amongst other things. In an FE approach, time-invariant variables are absorbed by the intercept. RE assume no correlation between the individual countries' error term and the exogenous variables, by that allowing those variables that do not change with time an explanatory power on the exogenous variables. In developing a RE model, the importance is to correctly specify the country-specific characteristics that may be or may not be associated with the determinant variables. The challenge of correctly specifying the individual characteristics may not be feasible because of the unavailability of variables. This leads to omitted variables' limitation syndrome and bias in the model. Greene (2008) and Baltagi (2008) agree that the RE modelling framework enables the generalisation of the inference beyond the sample considered in the analysis.

The REs model can be represented as follows:

$$Y_{it} = \beta X_{it} + \alpha + u_{it} + \varepsilon_{it} \quad 4.4.10$$

Where: Y_{it}, β, X_{it}, α, and u_{it} are defined as before in the FE model. But u_{it} accounts for the between countries error and ε_{it} accounts for the intra-country error term. The assumption on the errors is that the country error terms are not correlated with the determinants, allowing for the time-invariant variables to have explanatory power. RE provides the ability to generalise inference outside the sample used in the model.

4.5.3.3 Diagnostic tests

The choice between the REs and the FE is based on the Hausman tests. Chi-square probability of less than 0.05 indicates that the REs should be preferred to the FE. The time-fixed effect can be performed using the F-statistic to jointly assess that all dummy variables across the years are equal to zero (0), then no time effects will be needed. The F-probability greater than 0.05 level of significance means that we fail to reject the null hypothesis. The Breusch-Pagan Lagrange Multiplier can be an advanced measure of the REs. This method helps in choosing between the REs regression and the simple OLS regression analysis. Based on this, the null hypothesis states that the variances across countries are equal to zero implying there are no panel effects across the countries.

The BP-LM test uses the chi-square distribution, again, a chi-square probability value greater than 0.05 implies there are no significant differences across the countries, therefore, the REs is not appropriate. OLS estimation would be ideal. The Breusch-Pagan Lagrange Multiplier can be used to assess for cross-sectional dependence. Baltagi (2008) indicates that this problem of cross-sectional dependence is common in panel data covering periods of more than 20 years. The present study is not likely to have this problem since the data are only collected for 18 years. The null hypothesis in this test is that residuals across entities are not correlated and there is no heteroscedasticity. Chi-square distribution probabilities greater than 0.05 level of significance fails to reject the null hypothesis, implying no cross-sectional dependence and homoscedasticity. The researcher allures the heteroscedasticity problem by estimating more robust results. Similarly, testing for serial correlation in macro panels is important because serial correlation causes the standard errors of the coefficients to be smaller than their actual values and yielding high R-squared. The Breusch-Pagan LM tests yield F distribution where the probability of F statistics should be greater than 0.05 level of significance to reject the presence of serial correlation.

4.5.3.4 The pooled OLS empirical representation

In the study, three models were estimated; these were the FE with dummies (LSDV), FE, and REs model. The formation of these three models is based on the section explained above. A total of 18 equations were estimated as follows:

Equations for the fixed effects with dummies (LSDV)

$$SRII_t = \beta_0 + \sum_{i=1}^{5} \beta_1 RGDPG_t + \sum_{i=1}^{5} \beta_2 GCFG_t + \sum_{i=1}^{5} \beta_3 GINII_t + \sum_{i=1}^{5} \beta_4 HDI_t + \sum_{i=1}^{5} \beta_5 POV_t + \emptyset_{ij} Country\ dummies + \varepsilon_t \quad 4.4.11$$

$$RGDPG_t = \beta_0 + \sum_{i=1}^{5} \beta_1 SRII_t + \sum_{i=1}^{5} \beta_2 GCFG_t + \sum_{i=1}^{5} \beta_3 GINII_t + \sum_{i=1}^{5} \beta_4 HDI_t + \sum_{i=1}^{5} \beta_5 POV_t + \emptyset_{ij} Country\ dummies + \varepsilon_t \quad 4.4.12$$

$$GCFG_t = \beta_0 + \sum_{i=1}^{5} \beta_1 SRII_t + \sum_{i=1}^{5} \beta_2 R\ GDPG_t + \sum_{i=1}^{5} \beta_3 GINII_t + \sum_{i=1}^{5} \beta_4 HDI_t + \sum_{i=1}^{5} \beta_5 POV_t + \emptyset_{ij} Country\ dummies + \varepsilon_t \quad 4.4.13$$

$$GINII_t = \beta_0 + \sum_{i=1}^{5} \beta_1 SRII_t + \sum_{i=1}^{5} \beta_2 R\ GDPG_t + \sum_{i=1}^{5} \beta_3 GCFG_t + \sum_{i=1}^{5} \beta_4 HDI_t + \sum_{i=1}^{5} \beta_5 POV_t + \emptyset_{ij} Country\ dummies + \varepsilon_t \quad 4.4.14$$

$$HDI_t = \beta_0 + \sum_{i=1}^{5} \beta_1 SRII_t + \sum_{i=1}^{5} \beta_2 R\ GDPG_t + \sum_{i=1}^{5} \beta_3 GINII_t + \sum_{i=1}^{5} \beta_4 GCFG_t + \sum_{i=1}^{5} \beta_5 POV_t + \emptyset_{ij} Country\ dummies + \varepsilon_t \quad 4.4.15$$

$$POV_t = \beta_0 + \sum_{i=1}^{5} \beta_1 SRII_t + \sum_{i=1}^{5} \beta_2 RGDPG_t + \sum_{i=1}^{5} \beta_3 GCFG_t + \sum_{i=1}^{5} \beta_4 GINII_t + \sum_{i=1}^{5} \beta_5 HDI_t + \sum_{i=1}^{5} \emptyset\ Country\ dummies_t + \varepsilon_t \quad 4.4.16$$

The Equations 4.4.11 to 4.4.16 indicate how the pooled OLS (LSDV) models were formulated. These differ from the fixed and REs in that they factor in the dummy variables, such as the country dummies. The exogenous variables under consideration are:

the real growth rate of the gross domestic product (RGDPG)

- the GCFG
- national poverty headcount ratio (POV)
- the Income inequalities ratio (Gini)
- the HDI

The SRII constructed in this study is used to represent the regional integration measure and ε_t represents uncorrelated disturbances (the usual white noise residuals), β_0 is the drift component.

The FE model without dummies has the following formation:

$$SRII_t = \beta_0 + \sum_{i=1}^{5} \beta_1 RGDPG_t + \sum_{i=1}^{5} \beta_2 GCFG_t + \sum_{i=1}^{5} \beta_3 GINII_t + \sum_{i=1}^{5} \beta_4 HDI_t + \sum_{i=1}^{5} \beta_5 POV_t + \emptyset_{ij} T + \varepsilon_t \quad 4.4.17$$

$$RGDPG_t = \beta_0 + \sum_{i=1}^{5} \beta_1 SRII_t + \sum_{i=1}^{5} \beta_2 GCFG_t + \sum_{i=1}^{5} \beta_3 GINII_t + \sum_{i=1}^{5} \beta_4 HDI_t + \sum_{i=1}^{5} \beta_5 POV_t + \emptyset_{ij} T + \varepsilon_t \quad 4.4.18$$

$$GCFG_t = \beta_0 + \sum_{i=1}^{5} \beta_1 SRII_t + \sum_{i=1}^{5} \beta_2 R\,GDPG_t + \sum_{i=1}^{5} \beta_3 GINII_t + \sum_{i=1}^{5} \beta_4 HDI_t + \sum_{i=1}^{5} \beta_5 POV_t + \emptyset_{ij} T + \varepsilon_t \quad 4.4.19$$

$$GINII_t = \beta_0 + \sum_{i=1}^{5} \beta_1 SRII_t + \sum_{i=1}^{5} \beta_2 R\,GDPG_t + \sum_{i=1}^{5} \beta_3 GCFG_t + \sum_{i=1}^{5} \beta_4 HDI_t + \sum_{i=1}^{5} \beta_5 POV_t + \emptyset_{ij} T + \varepsilon_t \quad 4.4.20$$

$$HDI_t = \beta_0 + \sum_{i=1}^{5} \beta_1 SRII_t + \sum_{i=1}^{5} \beta_2 R\,GDPG_t + \sum_{i=1}^{5} \beta_3 GINII_t + \sum_{i=1}^{5} \beta_4 GCFG_t + \sum_{i=1}^{5} \beta_5 POV_t + \emptyset_{ij} T + \varepsilon_t \quad 4.4.21$$

$$POV_t = \beta_0 + \sum_{i=1}^{5} \beta_1 SRII_t + \sum_{i=1}^{5} \beta_2 RGDPG_t + \sum_{i=1}^{5} \beta_3 GCFG_t + \sum_{i=1}^{5} \beta_4 GINII_t + \sum_{i=1}^{5} \beta_5 HDI_t + \sum_{i=1}^{5} \emptyset\, T_t + \varepsilon_t \quad 4.4.22$$

The random-effects model has the following formation:

$$SRII_t = \beta_0 + \sum_{i=1}^{5} \beta_1 RGDPG_t + \sum_{i=1}^{5} \beta_2 GCFG_t + \sum_{i=1}^{5} \beta_3 GINII_t + \sum_{i=1}^{5} \beta_4 HDI_t + \sum_{i=1}^{5} \beta_5 POV_t + \mu_t + \varepsilon_t \quad 4.4.23$$

$$RGDPG_t = \beta_0 + \sum_{i=1}^{5} \beta_1 SRII_t + \sum_{i=1}^{5} \beta_2 GCFG_t + \sum_{i=1}^{5} \beta_3 GINII_t + \sum_{i=1}^{5} \beta_4 HDI_t + \sum_{i=1}^{5} \beta_5 POV_t + \mu_t + \varepsilon_t \quad 4.4.24$$

$$GCFG_t = \beta_0 + \sum_{i=1}^{5} \beta_1 SRII_t + \sum_{i=1}^{5} \beta_2 R\ GDPG_t + \sum_{i=1}^{5} \beta_3 GINII_t + \sum_{i=1}^{5} \beta_4 HDI_t + \sum_{i=1}^{5} \beta_5 POV_t + \mu_t + \varepsilon_t \quad 4.4.25$$

$$GINII_t = \beta_0 + \sum_{i=1}^{5} \beta_1 SRII_t + \sum_{i=1}^{5} \beta_2 R\ GDPG_t + \sum_{i=1}^{5} \beta_3 GCFG_t + \sum_{i=1}^{5} \beta_4 HDI_t + \sum_{i=1}^{5} \beta_5 POV_t + \mu_t + \varepsilon_t \quad 4.4.26$$

$$HDI_t = \beta_0 + \sum_{i=1}^{5} \beta_1 SRII_t + \sum_{i=1}^{5} \beta_2 R\ GDPG_t + \sum_{i=1}^{5} \beta_3 GINII_t + \sum_{i=1}^{5} \beta_4 GCFG_t + \sum_{i=1}^{5} \beta_5 POV_t + \mu_t + \varepsilon_t \quad 4.4.27$$

$$POV_t = \beta_0 + \sum_{i=1}^{5} \beta_1 SRII_t + \sum_{i=1}^{5} \beta_3 RGDPG_t + \sum_{i=1}^{5} \beta_4 GCFG_t + \sum_{i=1}^{5} \beta_5 GINII_t + \sum_{i=1}^{5} \beta_6 HDI_t + \mu_t + \varepsilon_t \quad 4.4.28$$

Both, the fixed effects, and the REs models differ from the FE models with pooled dummies of individual countries, whilst the fixed effect within has no dummies in their formation. The REs differ from the FE in that they have two error terms where one represents the error amongst countries and the other one errors within the variables.

Therefore, a total of 18 equations were estimated and are summarised in .

Table 4.3.

Table 4.3: Summary of the number of models estimated in this section

Model	**Dependent variable**	**Independent variables**					
Pooled OLS	SRII	GCFG	RGDPG	HDI	Gini	POV	Country dummies included
	GCFG	RGDPG	HDI	Gini	POV	SRII	Country dummies included
	RGDPG	HDI	Gini	POV	SRII	GCFG	Country dummies included
	HDI	Gini	POV	SRII	GCFG	RGDPG	Country dummies included
	Gini	POV	SRII	GCFG	RGDPG	HDI	Country dummies included
	POV	SRII	GCFG	RGDPG	HDI	Gini	Country dummies included
FE model	SRII	GCFG	RGDPG	HDI	Gini	POV	No dummies
	GCFG	RGDPG	HDI	Gini	POV	SRII	
	RGDPG	HDI	Gini	POV	SRII	GCFG	
	HDI	Gini	POV	SRII	GCFG	RGDPG	
	Gini	POV	SRII	GCFG	RGDPG	HDI	

Model	Dependent variable	Independent variables					
	POV	SRII	GCFG	RGDPG	HDI	Gini	
Random-effects Model							
	SRII	GCFG	RGDPG	HDI	Gini	POV	No dummies
	GCFG	RGDPG	HDI	Gini	POV	SRII	
	RGDPG	HDI	Gini	POV	SRII	GCFG	
	HDI	Gini	POV	SRII	GCFG	RGDPG	
	Gini	POV	SRII	GCFG	RGDPG	HDI	
	POV	SRII	GCFG	RGDPG	HDI	Gini	
Total							

The study used OLS (*T=18, N=5,* such as a total of 90 observations) to obtain a single intercept coefficient and a single slope coefficient for each of the explanatory variables.

4.6 CHAPTER SUMMARY

This chapter discusses the methodology used in this study to meet the intended objectives through an empirical analysis. This methodology chapter explains the quantitative-based approaches used to assess the effect of regional integration on socio-economic development in the SACU countries. First, the methods applied in constructing the SRII, a proxy for regional integration were discussed. These included

selecting indicators and their sources, the normalisation and aggregation processes using the PCA technique. This was followed by a discussion of the OLS (LSDV), FE, and REs models applied in assessing the effect of regional integration on socio-economic development. The next chapter presents the research findings.

CHAPTER 5: EMPIRICAL RESULTS: CONSTRUCTION OF THE SACU REGIONAL INTEGRATION INDEX

5.1 INTRODUCTION

Following the statistical models developed in the methodology chapter, this chapter presents the SRII constructed. All the procedures followed, and their outcomes are displayed in this chapter. This chapter reports all the processes followed from selecting variables, data normalisation, the aggregation scheme, and the weighting of each indicator in each dimension. The overall index is constructed for each of the SACU countries, indicating Botswana, Lesotho, Namibia, Eswatini and South Africa, including the SACU overall index.

5.2 SRII EMPIRICAL RESULTS

Initially, this study had five dimensions, indicating trade integration, infrastructure integration, production integration, free movement of people and the finance and macroeconomic policy integration. These dimensions comprised a total of 16 indicators as adopted from the ARII (2016). The dimension of the free movement of people was released from the study. The indicators in this dimension included levels of customs duties were excluded. These include intraregional inputs, ratification by the country of REC protocol on the free movement of people, the proportion of REC member countries where nationals' may obtain a visa before entry or on arrival, and the regional convertibility of national currencies.

These indicators could not be considered based on the absence of variability along with the time series and across the countries. If a variable is the same across countries and years, then it may not be useful for country comparisons as it indicates similar patterns. If a variable is the same across countries and years, then it may not be useful for country comparisons as it indicates similar patterns. These were omitted at the normalisation stage in the analysis. Other variables within the infrastructure dimension were excluded due to the unavailability of data on two indicators under regional infrastructure dimension. The average costs of intraregional roaming and the proportion of intraregional flights were omitted.

This resulted in the SACU index being constructed with only four (4) dimensions and nine (9) indicators instead of all the six dimensions and 16 indicators. The removal of these variables does not completely exclude their importance in defining the levels of integration. The following signifies a prominent level of integration:

- absence of customs duties
- no visa required before visiting or on arrival on nationals of member countries
- the ratification of REC protocol on the free movement of people by countries
- convertibility of currencies at an equal rate

5.2.1 Data normalisation outcome

At this stage, some more variables were removed based on the absence of variability along with the time series and across the countries. If a variable is the same across member countries and years, then it may not be useful for country comparisons as it indicates similar patterns. This resulted in the following variables as defined in Table 4.1 in the previous chapter excluded from the index construction:

1a. Levels of customs duties on intraregional inputs.

According to SACU reports, there are no customs duties charged on intra-SACU imports to member states. In Appendix A, this variable has zero (0) across countries over the years under consideration.

4a. Ratification by the country of REC protocol on the free movement of people.

The zeros (0) on the variable indicate that none of the SACU countries signed the REC protocol on the free movement of people. This ratified the protocol on the free movement of people in the region, according to SACU policy documents.

4b and 4c. The proportion of REC member countries where nationals' may obtain a visa on arrival.

SACU policy documents reveal that no visas are required from member countries when travelling around the region.

5a. Regional convertibility of national currencies. This variable indicated a lack of variability, which could be used for comparisons of countries as most of the member countries belong to the CMA.

Effectively, nine variables remained under consideration, as listed in Table 5.1.

Table 5.1: SACU Regional Integration Index analysed dimensions and indicators

Code	**Variable**	**Abbreviation**
1b	share of intraregional goods exports (% of GDP)	SGDPE
1c	share of intraregional goods imports (% of GDP)	SGDPI
1d	share of intraregional goods trade (% of intra-REC trade)	SGDPT
2a	Infrastructure development index	IDI
2b	Total regional electricity trade (net) per capita (absolute value)	ETCP
3a	Share of intraregional intermediate goods exports (% total intraregional goods exports)	IRGE
3b	Share of intraregional intermediate goods imports (% total intraregional goods imports)	IRGI
3c	Merchandise trade complementarity index	MTCI
5b	Inflation rate differential	IRD

To normalise the data, the min-max method formula was applied as follows:

$$(observed\ min - data \min value)/(\ data \max value - data \min value) * (1 - 0) + 0$$

Where the observed minimum is the actual value of the indicator on that specific point in time. The data minimum value is the minimum value across the indicator data set, and the maximum data value is the maximum value across the indicator data set over the observed period. The above formula was applied to the collected panel data, and the normalised data are presented in Appendix B.

5.3 DESCRIPTIVE STATISTICS

The descriptive statistics of all nine variables are presented in Table 5.2. The 90 observations indicate all the values captured from 2000 to 2017 for the five countries. The minimum value of zero (0) and a maximum of 1 indicate that it is a balanced model. The mean represents the typical value of each variable whilst the standard deviation indicates how far apart the individual observations are from the central values of a provided variable. Descriptive statistics allow for the comparison of the relative sizes of the standard deviation. The standard deviations presented are about the same sizes so we could analyse the correlations matrix. Comparing the standard deviation and their means, they are lower, indicating a lower variability in the size of variables amongst countries. The min and max values mark the boundaries and from the results presented, there are no outliers as the distribution should have a mean of zero (0) and a variance of one (1).

Table 5.2: Descriptive statistics

Variable	Observations	Mean	Std. Dev.	Min	Max
SGDPE	90	0.3655224	0. 3063001	0	1
SGDPI	90	0.5338228	0.340463	0	1
SGDPT	90	0.6237749	0.2561489	0	1
IDI	90	0.4975375	0.3484721	0	1
ETCP	90	0.5058591	0.3237061	0	1
IRGE	90	0.4086312	0.3312078	0	1
IRGI	90	0.3933615	0.3795301	0	1
MTCI	90	0.510239	0.2896134	0	1
IRD	90	0.4704227	0.2694167	0	1

5.4 CORRELATION COEFFICIENTS MATRIX

This section presents the results of the correlations between variables obtained. Correlations help the researcher to understand how the variables in the data input are varying from each other. In some cases, variables may be highly correlated that they contain redundant information. The correlation coefficient matrix presented in Table 5.3 indicates that the correlation between each of the variables and themselves are all

equal to one as indicated by the diagonal coefficients. The off-diagonal elements give the relationship between each of the pairs of variables. Results presented in Table 5.3 indicate two variables, IDI and SGDPI. These are highly correlated and the correlation coefficient is 0.7069, followed by IRGE and SGDPE with a correlation coefficient of 0.5724; SGDPI and IDI with 0.6663; and IDI and ETCP with 0. 5268. The presence of these variables with high correlation gives the need for a PCA.

Table 5.3: Correlation Coefficients Matrix

	SGDPE	SGDPI	SGDPT	IDI	ETCP	IRGE	IRGI	MTCI	IRD
SGDPE	1.0000								
SGDPI	0.3635	1.0000							
SGDPT	0.0889	0.0706	1.0000						
IDI	0.2687	0.7069	0.1006	1.0000					
ETCP	0.0315	0.3882	-0.0531	0.5268	1.0000				
IRGE	0.5724	0.0575	-0.1766	-0.0786	0.0429	1.0000			
IRGI	-0.0895	0.3285	-0.0744	-0.0675	-0.0810	0.1075	1.0000		
MTCI	-0.1752	-0.1394	0.2477	-0.1597	-0.1926	-0.0630	0.3261	1.0000	
IRD	-0.1537	0.1403	-0.1287	0.0906	0.0727	-0.2534	0.1697	-0.0090	1.0000

The coefficient of determination is another measure of association and is merely equal to the square of the correlation. For example, the ratio of determination between IDI and SGDPI is $(0.7069)^2$= 0.49970761. This means that about 49% of the variation in IDI is caused by the change in SDGPI and vice versa.

5.5 PRINCIPAL COMPONENT OUTPUT

Provided that some dimensions were entirely omitted, and others had a small number of indicators, the PCA aggregation scheme focused directly on indicators instead of taking a typical two-step method. PCA was applied to determine the number of PC required to capture the movements in the indicators.

The results presented in Table 5.4 indicate the eigenvalues of the correlation matrix. Eigenvalues indicate the variance explained by each principal component or each factor (Malhotra 2010). A standardised basis for selecting the principal components, which provides a small difference with the actual set of variables. The basis is defined

in such a way that each principal component should explain at least 5% of the variance; the cumulative variance of the chosen PCs is at least 75%; the eigenvalue of each PC selected is above one. This ensures that it can explain as much variance as the one explained by one variable on the diagonals of the correlation matrix (Zikmund & Babin 2013).

Based on the results in Table 5.4, the first four components have eigenvalues 2.34263; 1.66779; 1.4243; and 1.26114, respectively. The other components from the fifth to the ninth have eigenvalues below 1.0 eigenvalue criteria. The proportion of variance explained by the first four PCs is 26.03%; 18.53%; 15.83% and 14.01% giving a cumulative variance of 74.40% making these first four PCs to be the retained ones as they meet al l the required criteria.

Table 5.4: Principal component output

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp 1	2.34263	0.674836	0.2603	0.2603
Comp 2	1.66779	0.243486	0.1853	0.4456
Comp 3	1.4243	0.163164	0.1583	0.6039
Comp 4	1.26114	0.455139	0.1401	0.7440
Comp 5	0.806	0.172512	0.0896	0.8335
Comp 6	0.633487	0.149583	0.0704	0.9039
Comp 7	0.483904	0.258054	0.0536	0.9577
Comp 8	0.22585	0.0709486	0.0251	0.9826
Comp 9	0.154902		0.0172	1.0000

Figure 5.1 indicates the scree plot of the factors generated by employing PCA. The scree plot indicates that the first 4PCs are above 1.0 qualifying them to be the only ones to be retained.

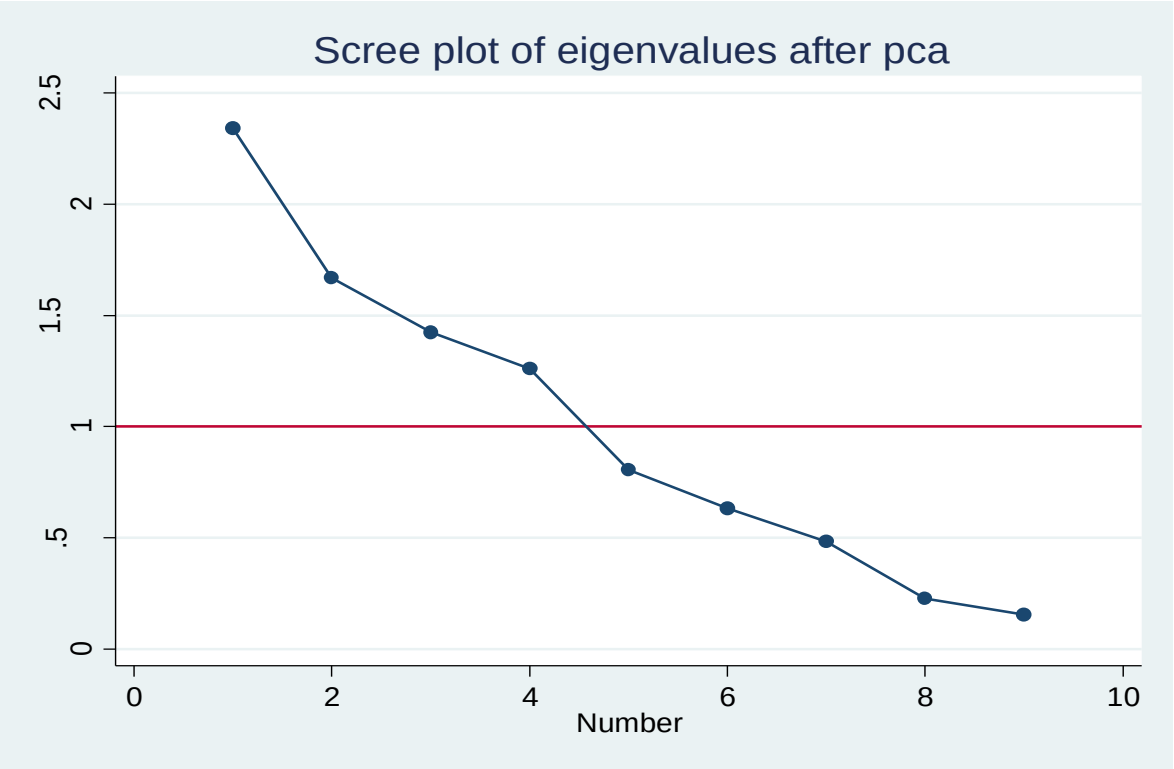

Figure 5.1: Scree plot (graph of eigenvalues)

5.6 RESULTS WITH THE FOUR IDENTIFIED COMPONENTS

Further analysis was conducted on the four components (n=4) that generated eigenvalues greater than one. The output in Table 5.5 illustrates eigenvalues indicating the variance explained and the eigenvectors, which are the weights in a linear transformation to indicate the weights to calculate the components scores.

Table 5.5: Principal components (eigenvectors)

Variable	Comp1	Comp2	Comp3	Comp4	Unexplained
SGDPE	0.3621	-0.4927	0.1736	0.0837	0.2362
SGDPI	0.5515	0.1765	0.2467	-0.0101	0.1488
SGDPT	0.0075	0.0818	0.1802	0.7731	0.1887
IDI	0.5500	0.2111	-0.0667	0.1818	0.1689
ETCP	0.4234	0.1763	-0.2170	-0.0226	0.4605
IRGE	0.1616	-0.6001	0.2642	-0.2331	0.1703
IRGI	0.0199	0.2054	0.6709	-0.3244	0.155
MTCI	-0.2324	0.1722	0.5522	0.2522	0.3095
IRD	0.0491	0.4602	0.0114	-0.3722	0.4663

The unexplained figures presented in the last column of Table 5.5 indicate the percentage of each variable, described by other factors not captured in the retained PCs. For example, the unexplained component for SGSPE of 0.2362 means that 23.62% of that variable is explained by the other factors, which are not amongst the four retained PCs. IRD has a higher unexplained component of 0.4663, meaning that 46.63% of that variable's variations are explained by outside factors, which are not within the retained PCs. A best variable is represented or defined by the four principal components as the SGDPI, which has only 14,88% not covered by the PCs.

5.7 WEIGHTS CONSTRUCTION

Squared loadings of indicators for the chosen principal components suggest which indicators are primarily associated with the PCs. Based on the results presented in Table 5.6, principal Component 1 is dominated by SGDPI from the first dimension on trade integration with the highest loading of 0.712516. There is also a relative association with the second dimension on regional infrastructure integration. The two indicators IDI (0.708646) and ETCP (0.419958) also have an association with PC1.

PC2 is mainly influenced by IRGE variable under the productive integration dimension followed by SGDPE under trade integration dimension with loadings of 0.600404 and 0.405355, respectively. The third principal component is primarily associated with the indicators from the productive integration, IRGI with loadings 0.641087 and the financial and macroeconomic policies dimension, MTCI with 0.434304 loadings. SGDPT dominates the fourth principal component under the trade integration with 0.753763 loadings. From the analysis of the squared loading, the trade integration dimension appears common across the PCs although all the indicators seem to be allocated different weights across the PCs. These results are summarised in Table 5.6.

Table 5.6: Squared loadings

		SQUARED LOADINGS		
VARIABLE	PC 1	PC 2	PC 3	PC 4
SGDPE	0.307157	0.405355	0.042924	0.008835
SGDPI	0.712516	0.051955	0.086684	0.000126
SGDPT	0.000132	0.01116	0.04625	0.753763
IDI	0.708646	0.074322	0.006394	0.041682
ETCP	0.419958	0.051838	0.067069	0.000667
IRGE	0.061177	0.600404	0.099418	0.068466
IRGI	0.000928	0.070089	0.641087	0.132717
MTCI	0.126525	0.049455	0.434304	0.080215
IRD	0.005648	0.353211	0.000185	0.174522
SUM of squared loadings (λ)	**2.342685**	**1.667789**	**1.424316**	**1.260992**
λ1+ λ2+ λ3+ λ4	**6.695782**			
θ [λ j / (λ1+ λ2+ λ3+ λ4)]	**0.349875**	**0.249081**	**0.212718**	**0.188326**

The overall weight of each indicator was calculated as a sum of the weights under each PC. The weights table below indicates that an average range of 12% weight is allocated to the indicators. The highest weighted indicator is the SGDPI with an overall weight of 12.71% of the total weight of indicators. The IRGI followed with 12.62% weight. Trade integration and productive integration indicators reflect the relatively higher weights compared to the other dimensions. The least weight is on IRD and ETCP with 7.97% and 8.1%, respectively. IRD is the only indicator under financial and macroeconomic integration, and it is the dimension with the least weight allocated. The regional infrastructure dimension is the second least with a relatively higher weight on IDI (12.41%) and the second least weighted indicator on ETCP (8.1%).

Table 5.7: Aggregated PC Weights giving the overall indicator weight

		WEIGHTS			
VARIABLE	PC 1	PC 2	PC 3	PC 4	OVEARAL WEIGHT (SUM)
SGDPE	0.0458732	0.060539	0.006411	0.00132	0.114142
SGDP1	0.1064127	0.007759	0.012946	1.88E-05	0.127137
SGDPT	1.968E-05	0.001667	0.006907	0.112573	0.121166
IDI	0.1058346	0.0111	0.000955	0.006225	0.124114
ETCP	0.0627197	0.007742	0.010017	9.96E-05	0.080578
IRGE	0.0091366	0.089669	0.014848	0.010225	0.123879
IRGI	0.0001386	0.010468	0.095745	0.019821	0.126172
MTCI	0.0188962	0.007386	0.064862	0.01198	0.103124
IRD	0.0008435	0.052751	2.76E-05	0.026064	0.079687
					1

Table 5.8:Weights summary for the SRII indicators

Code	**Variable**	**Abbreviation**	**Weights**
1b	share of intraregional goods exports(% of GDP)	SGDPE	0.114142
1c	share of intra -regional goods imports(% of GDP)	SGDPI	0.127137
1d	share of intraregional goods trade (% of intra-REC trade)	SGDPT	0.121166
2a	Infrastructure development index	IDI	0.124114
2b	Total regional electricity trade (net) per capita (absolute value)	ETCP	0.080578
3a	Share of intraregional intermediate goods exports (% total intraregional goods exports)	IRGE	0.123879
3b	Share of intraregional intermediate goods imports (% total intraregional goods imports)	IRGI	0.126172
3c	Merchandise trade complementarity index	MTCI	0.103124
5b	Inflation rate differential	IRD	0.079687

5.8 SRII CONSTRUCTED

Finally, the SRII was calculated as a linear combination of the original variables normalised data and the overall allocated weights per variable, as indicated in the equation 4.16:

$$SRII = 0.114142\mathbf{SGDPE} + 0.127137\mathbf{SGDPI} + 0.121166\mathbf{SGDPT} + 0.124114\,\mathbf{IDI} + 0.080578\mathbf{ETCP} + 0.123879\,\mathbf{IRGE} + 0.126172\,\mathbf{IRGI} + 0.103124\mathbf{MTCI} + 0.079687\,\mathbf{IRD}\ 4.16$$

The SRII was calculated per country from 2000 to 2017, and the final output is presented in Table 5.9.

Table 5.9: SACU Countries RII

	SACU Countries Regional Integration Index (SRII)					
Year	BOTSW	LESO	NAM	ESWAT	SA	SACU
2000	0.571817	0.222365	0.353053	0.22509	0.394115	0.353288
2001	0.349241	0.53269	0.370663	0.28369	0.430104	0.393278
2002	0.208265	0.579138	0.395872	0.310349	0.588698	0.416464
2003	0.274751	0.474453	0.284684	0.265496	0.548778	0.369633
2004	0.338514	0.497855	0.377696	0.223626	0.564727	0.400484
2005	0.34522	0.320248	0.418435	0.28044	0.582862	0.389441
2006	0.37014	0.334283	0.515109	0.405674	0.397154	0.404472
2007	0.344612	0.331876	0.413703	0.494022	0.480991	0.413041
2008	0.455756	0.347595	0.480187	0.470126	0.458465	0.442426
2009	0.591016	0.291195	0.472354	0.599151	0.548501	0.500443
2010	0.373139	0.412759	0.471007	0.592842	0.496571	0.469264
2011	0.57388	0.473689	0.45164	0.572247	0.565547	0.527401
2012	0.609493	0.455508	0.489091	0.649822	0.582557	0.557294
2013	0.657978	0.431492	0.597069	0.586099	0.684835	0.591494
2014	0.733216	0.484666	0.676514	0.558272	0.724763	0.635486
2015	0.790656	0.470187	0.695629	0.545959	0.736029	0.647692
2016	0.746959	0.567837	0.672254	0.629879	0.761579	0.675702
2017	0.752676	0.594599	0.655508	0.676823	0.764465	0.688814

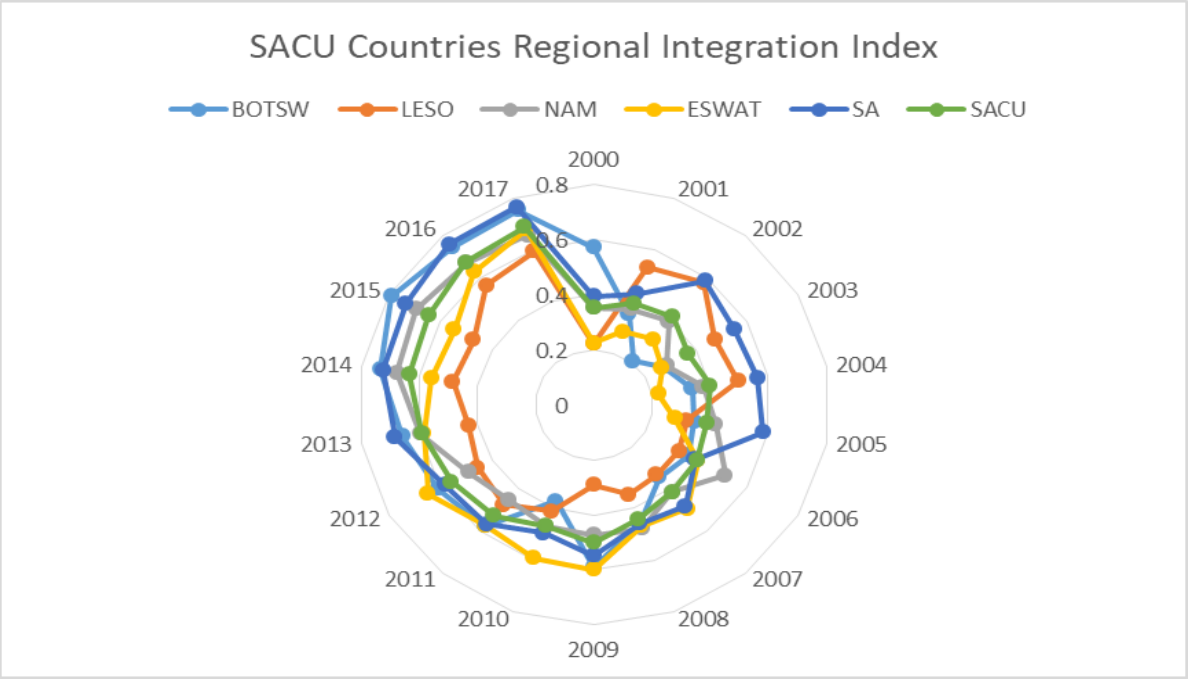

Figure 5.2: SACU countries regional integration index (SRII)

Figure 5.2 depicts the overall indexes for the SACU countries, based on the nine indicators falling under four dimensions. On average, across the 18 years under study, South Africa performed above the SACU regional average integration index. The highest index score of 0.764465 was experienced in the year 2017 and could have been contributed mainly by a high trade integration which contributed 61.43% followed by infrastructure, which has 26.39%. The lowest index score was in the year 2000 and 2006 where the indexes were 0.394115 and 0.39715, respectively. The second-best performing economy in regional integration is Botswana.

Botswana's index was the highest in the region in 2014 with an index of 0.833216. The worst year for Botswana was 2002 when it had an overall of 0.208265. The infrastructure dimension, and the finance and macroeconomic dimensions were performing poorly pulling the overall performance down. Namibia comes third with its indexes fluctuating around the regional average. The highest index for Namibia is 0.695629 in the year 2015. The worst year for Namibia is 2003 with an index of 0.284684. Namibia had weak infrastructure development during this period.

Eswatini ’s regional integration was above average between 2006 and 2013; all other years it was below average. The best year for Eswatini was 2017 where it scored 0.6888 and the worst was experienced in 2004 where it scored 0.223626. Lesotho performed exceedingly well and above average between 2001 and 2005 with its highest index of 0.579138 in 2002. All other years it has indicated below region average with its worst index in the year 2000 where it has 0.222365. On average, all the SACU countries RII are improving each year, as revealed in Figure 5.2.

For comparison of the countries over the years, Figure 5.3, Figure 5.4, and Figure 5.5 indicate the contributions to the index by various dimensions for six years. This breaks down the period under study into three categories, indicating 2000 to 2005; 2006 to 2011; and 2012 to 2017. Figure 5.3 reveals that all the SACU countries are dominated by trade and productive integration. Botswana and Lesotho have an equal contribution from the two dimensions. In South Africa, Namibia and Eswatini production integration were the highest followed by trade integration. There is a deficient concentration on financial and macroeconomic policies harmonisation and infrastructure integration. These two dimensions are shallow in all countries.

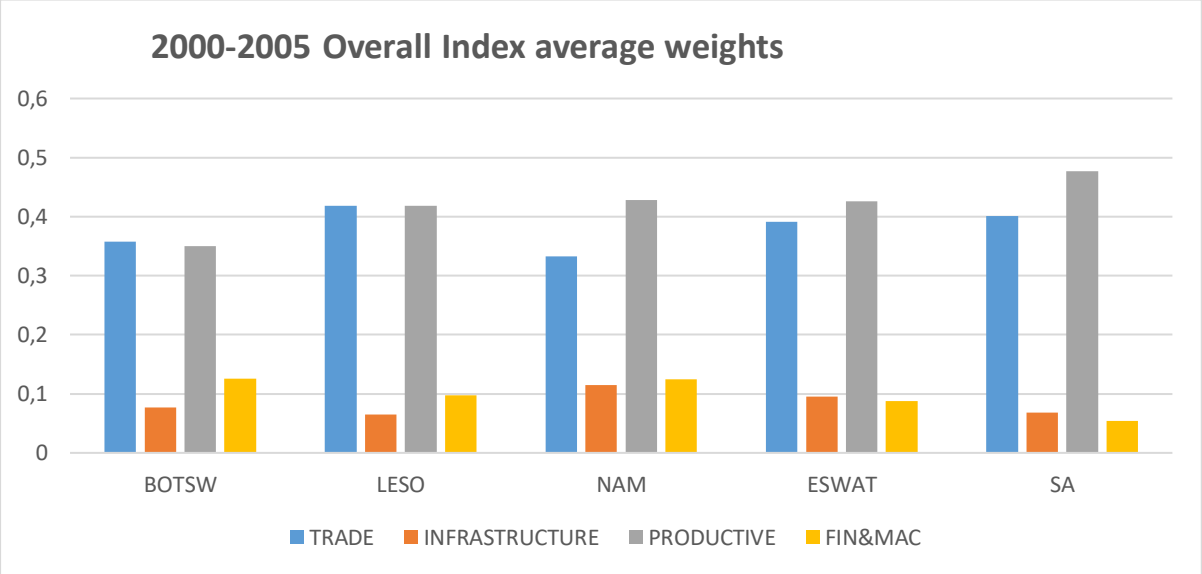

Figure 5.3: Overall index average weights for the period 2000 to 2005

The period from 2006 to 2011 saw an extremely high integration in infrastructure. All the countries’ infrastructure integration dimension improved, as indicated in Figure 5.4.

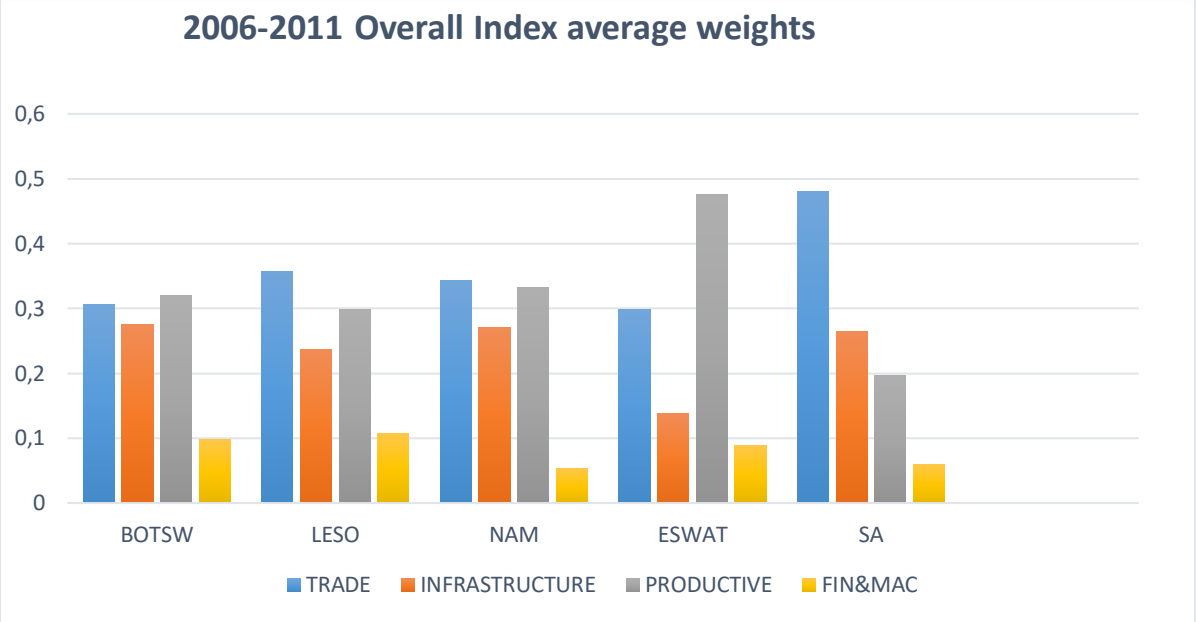

Figure 5.4: Overall index average weights for the period 2006 to 2011

As time progressed from 2012 onwards (Figure 5.5), there were more developments in the infrastructure integration with increased trade integration. All the SACU countries improved in the first three dimensions. The challenge remains with the financial and macroeconomic policies integration. There is a noticeable decline, especially in Botswana from 0.125 in the first period to 0.098 in the second period and 0.029 in the last period. The same applies to Lesotho and Namibia, where their financial and macroeconomic integration indexes have lowered. South Africa and Eswatini are the only member states showing some improvement in the financial and macroeconomic integration. South Africa improved from 0.053 in 2000 to 2006 to 0.058 and 0.0699 in the last period. Eswatini improved from 0.087 to 0.088 and 0.107 in the previous period.

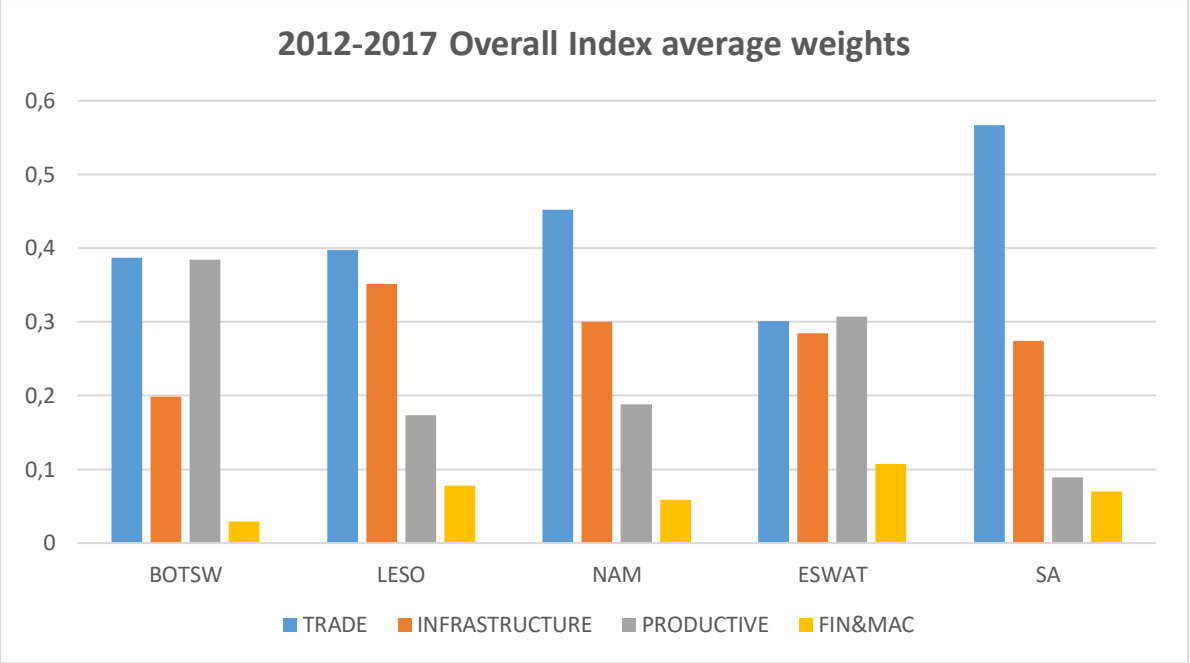

Figure 5.5: Overall index average weights for the period 2012 to 2017

5.9 CHAPTER SUMMARY

The construction of the dependent variable to the study, the SRII was the focus of this chapter. This index was constructed using the PCA method. The index reveals there is an increased effort towards improving all the different areas of regional integration. Mostly, the trade, productive and infrastructure dimensions are dominating the overall indexes. There is an upward trend in regional integration across the SACU countries over the period under study.

CHAPTER 6: RESEARCH FINDINGS PRESENTATION, ANALYSIS, AND INTERPRETATION

6.1 INTRODUCTION

This chapter discusses the research findings on the primary research objective, which sought to analyse the effect of regional integration on the socio-economic development in the SACU countries. The first part of the results re-examines the key variables by presenting their descriptive statistics. Following this is the presentation and discussions on the FE models with pooled dummies – the least square dummy variable, fixed and REs models generated from the panel data. The panel data techniques were chosen for their ability to give a more robust, reliable, and valid analysis of cross-sections of the SACU countries. This chapter concludes with a summary of the research findings.

6.2 SACU COUNTRIES TIME-SERIES DATA DESCRIPTIVE STATISTICS

6.2.1 Individual countries descriptive statistics

The descriptive statistics for individual countries are presented in Table 6.1. The average of regional integration index (SRII) varies from the lowest level of 0.4345 for Lesotho and the highest level of 0.5944 for South Africa. These results indicate that South Africa scores above all other members of SACU in integration levels. According to the SACU regional integration constructed in this research, South Africa scores high in trade integration with 48% followed by productive integration with 25,45%, regional infrastructure 20% and financial integration and convergence of macroeconomic policies with 6,5%, respectively. These findings corroborate the findings of Manwa (2015), who affirmed that South Africa is more open to trade and more liberalised compared to its SACU counterparts.

The standard deviation of SRII across the countries is minimal, around 0.1 showing some consistency in the efforts towards integrating across the region. Concerning trade openness, measured as the proportion of total trade to GDP, Lesotho averages 130.76 being the highest in the area and South Africa has 52.31 which is the lowest in the region. This component is related to the size of the economy. Lesotho is smaller

concerning productivity and sustenance such that she tends to rely more on importing compared to other countries. Lesotho's total trade exceeds its domestic total production, such as it imports more into the country than what it produces. Concerning South Africa, its GDP is extremely high, and it also imports less than the other countries as such the total trade will be less compared to its output.

Botswana takes the lead gross capital investments. The rate of growth is highest in Botswana with 15.2211 and lowest in Eswatini, which is 5.44. Botswana also has the lowest poverty levels in the region, with an average of 22.9 concerning the highest average recorded in Eswatini of 65.83. World Bank (2015) reports that in Africa there are just a few countries that fully fund themselves on social protection programmes and Botswana is one of them. It has dedicated about 4.4% of its GDP towards the social welfare of the citizens. This social spending has been effective in reducing poverty. These social funding activities have also been implemented through civil servants' wages, which helped to increase income from both formal and informal economic activities, especially in rural areas. The government increased its support to the agriculture sector and created more employment opportunities. The World Bank 2015 also noted that the changes in demographics also contributed to poverty reduction. Various government projects created employment opportunities, whilst also increasing investment levels in the country.

Namibia recorded the highest RGDP growth in the region averaging 4.177 with exceedingly high levels of inequalities in the area with an average of 62.62. The poverty standard deviation is extremely high, scoring 4.9. This indicates a considerable divergence between those living in poverty and those who are privileged. The extremely high poverty levels could be explained by the unequal distribution of benefits from high growth rates. High inequalities indicate that the divergence between the privileged and the underprivileged is too high as only a few people are accessing the economic means.

This finding was earlier expressed in Ravallion (2001), that an increase in growth could cause the inequalities divergence widening due to unequal distribution of income and assets amongst the individuals and productive sectors within the economy. Here, integration may be perceived as inadequate, whereas it could be taken advantage of

to uplift everyone. It is a matter of harmonisation of policies to ensure fair participation and benefits to every member state.

South Africa experienced higher levels of HDI levelling an average of 0.646, which is the highest in the region. The least HDI is 0.485 in Lesotho. The standard deviation in HDI ranged from 0.022 to 0.055 across the region, showing minimal discrepancies. SACU (2011) reported that the human capital levels in the SACU countries are closely aligned with microscopic variance reflecting the region's colonial education system. Besides the education component, the descriptive statistics indicate extremely high growth rates in RGDP, ranging between 3% to 4% on average in the countries. This factor also contributes to human development across the region. The Jargue-Bera test for normality indicates that most of the variables assume a normal distribution, meaning the expected of each variable has normal independent distribution property of zero means and the variance of 1. Jargue-Bera values are less than the value of 10.

Table 6.1: SACU countries time-series data descriptive statistics

BOTSWANA

MEASURE	GCFG	GINII	HDI	POV	RGDPG	SRII	TRADE
Mean	15.22111	61.62374	0.640056	22.92609	4.082778	0.511291	83.51111
Median	10.41000	61.44710	0.643500	21.03935	4.530000	0.513787	81.55000
Maximum	80.02000	67.93500	0.717000	35.19000	11.30000	0.833216	109.1000
Minimum	-13.75000	53.30000	0.565000	16.84880	-7.700000	0.208265	64.60000
Std. Dev.	19.65659	4.438649	0.055410	6.037301	4.395738	0.195698	10.91070
Skewness	2.014081	-0.281872	-0.060810	0.842884	-0.931250	0.210234	0.662555
Kurtosis	7.778207	2.035640	1.518066	2.393460	4.124704	1.736457	3.265286
Jarque-Bera	29.29301	0.935847	1.658189	2.407278	3.550400	1.330001	1.369720
Probability	0.000000	0.626301	0.436444	0.300100	0.169450	0.514273	0.504161
Sum	273.9800	1109.227	11.52100	412.6696	73.49000	9.203231	1503.200

Sum Sq. Dev.	6568.484	334.9273	0.052195	619.6330	328.4828	0.651064	2023.738
Observations	18	18	18	18	18	18	18

LESOTHO

MEASURE	**GCFG**	**GINII**	**HDI**	**POV**	**RGDPG**	**SRII**	**TRADE**
Mean	8.381111	53.37134	0.485111	61.09402	3.389444	0.434580	130.7667
Median	2.945000	53.29120	0.484500	61.34598	3.135000	0.462848	127.8000
Maximum	53.56000	54.20000	0.520000	61.99100	6.660000	0.594599	152.6000
Minimum	-10.53000	53.10000	0.458000	59.70000	0.000000	0.222365	114.1000
Std. Dev.	18.24059	0.310571	0.022324	0.699894	2.205180	0.106426	13.12730
Skewness	1.177642	2.195395	0.146307	-0.354488	0.049372	-0.289977	0.381478
Kurtosis	3.431174	6.387508	1.451148	1.813734	1.891523	2.146379	1.735005
Jarque-Bera	4.299957	23.06569	1.863423	1.432405	0.928854	0.798762	1.636735
Probability	0.116487	0.000010	0.393879	0.488604	0.628495	0.670735	0.441151
Sum	150.8600	960.6842	8.732000	1099.692	61.01000	7.822436	2353.800
Sum Sq. Dev.	5656.222	1.639727	0.008472	8.327484	82.66789	0.192549	2929.540
Observations	18	18	18	18	18	18	18

NAMIBIA

MEASURE	GCFG	GINII	HDI	POV	RGDPG	SRII	TRADE
Mean	12.78667	62.62829	0.591111	28.45276	4.177778	0.488359	82.87778
Median	9.540000	62.99420	0.579000	31.52363	4.720000	0.471680	83.30000
Maximum	51.49000	63.80802	0.647000	33.35200	12.27000	0.695629	102.7000
Minimum	-22.33000	59.10000	0.554000	13.40000	-0.870000	0.284684	65.20000
Std. Dev.	21.31858	1.234563	0.035988	4.896577	3.230634	0.123558	11.94810
Skewness	0.244401	-1.466380	0.421208	-1.698605	0.483083	0.392688	0.032851
Kurtosis	2.295746	4.726197	1.539462	5.882495	3.328421	2.055376	1.855658
Jarque-Bera	0.551176	8.685628	2.132127	14.88736	0.781002	1.131848	0.985377
Probability	0.759126	0.013000	0.344361	0.000585	0.676718	0.567835	0.610982
Sum	230.1600	1127.309	10.64000	512.1497	75.20000	8.790469	1491.800
Sum Sq. Dev.	7726.190	25.91046	0.022018	407.5999	177.4289	0.259532	2426.871
Observations	18	18	18	18	18	18	18

ESWATINI

MEASURE	GCFG	GINII	HDI	POV	RGDPG	SRII	TRADE
Mean	5.441667	52.16456	0.521944	65.83328	3.284444	0.464978	102.0222
Median	5.740000	52.01400	0.522000	64.12500	3.705000	0.519991	95.85000
Maximum	16.00000	53.25942	0.588000	69.13355	6.860000	0.676823	143.7000
Minimum	-4.090000	50.90000	0.454000	63.00000	0.000000	0.223626	78.00000
Std. Dev.	5.061956	0.849237	0.049565	2.701331	2.029692	0.159565	24.31387
Skewness	0.061406	0.076699	-0.011325	0.328430	-0.014610	-0.339074	0.666186
Kurtosis	2.455311	1.455616	1.495129	1.206146	1.990388	1.546052	1.973128

Jarque-Bera	0.233827	1.806488	1.698862	2.737035	0.765128	1.930387	2.122261
Probability	0.889662	0.405253	0.427658	0.254484	0.682110	0.380909	0.346064
Sum	97.95000	938.9621	9.395000	1184.999	59.12000	8.369609	1836.400
Sum Sq. Dev.	435.5979	12.26045	0.041763	124.0523	70.03404	0.432835	10049.79
Observations	18	18	18	18	18	18	18

SOUTH AFRICA

MEASURE	**GCFG**	**GINII**	**HDI**	**POV**	**RGDPG**	**SRII**	**TRADE**
Mean	10.90500	62.55541	0.646000	24.03498	2.927222	0.594486	52.31111
Median	9.900000	63.24000	0.637500	18.61000	2.970000	0.582709	52.15000
Maximum	23.89000	64.82640	0.699000	37.14772	5.600000	0.824763	63.60000
Minimum	-5.330000	57.80000	0.610000	16.50000	-1.540000	0.394115	43.50000
Std. Dev.	8.502737	2.110303	0.032009	8.430058	1.838653	0.136954	6.622323
Skewness	-0.052896	-1.045550	0.449567	0.569784	-0.546705	0.130186	0.072159
Kurtosis	2.124392	2.922695	1.696740	1.603318	3.199639	1.842299	1.748773
Jarque-Bera	0.583411	3.284005	1.880197	2.437001	0.926550	1.056049	1.189798
Probability	0.746988	0.193592	0.390589	0.295673	0.629220	0.589769	0.551618
Sum	196.2900	1125.997	11.62800	432.6297	52.69000	10.70074	941.6000
Sum Sq. Dev.	1229.041	75.70741	0.017418	1208.120	57.47096	0.318859	745.5378
Observations	18	18	18	18	18	18	18

6.2.2 SACU countries time-series data line graphs

The graphical presentation (Figure 6.1, Figure 6.2, Figure 6.3, Figure 6.4, Figure 6.5, and Figure 6.6) of the variable indicate that composite index (SRII) trends upward across all countries within SACU. Real GDP growth tends to trend downwards, with Botswana showing the largest dip before the 2008 world economic recession. Small economies of Lesotho, Eswatini and to some extend Namibia, RGDPG mimics the fluctuations in the South African economy. This could be explained by three small economies, LNS, heavily relying on South Africa in their economic activities in general.

A study by Arora and Vamvakidis (2005), indicated that South African economic growth (1970 – 2003) had a significant positive effect on growth in other African countries, with a 1-percentage-point increase in South African growth being associated with a 0.5 - 0.75 percentage point increase in the rest of Africa's growth. They noted that the share was substantially larger in the CMA countries ranging up to 20% of GDP. This could explain the relationship between South Africa and LNS's RGDP. It can be noted that the capital flow appears more stable in South Africa than the four minor economies. This is true for South Africa because it is a large country with massive capital formation and investment in SACU. HDI is trending positive, with most SACU countries striving towards enhancing better opportunities for citizens. This can be conducted through the persuasion of SDGs and formulation of national development plans to address the aspects of poverty, education access and health concerns.

Figure 6.5 indicates the levels of inequalities in SACU countries. All countries indicate a nearly constant decline in inequality levels. Botswana indicates huge milestones in inequalities reduction. This could be because of the increased safety nets, as explained before. Figure 6.6 reveals a declining trend in the poverty levels in SACU countries with South Africa and Botswana, showing a faster pace than Lesotho and Eswatini. Namibia, on the contrary, indicates an increase from in the last two years of the period under study.

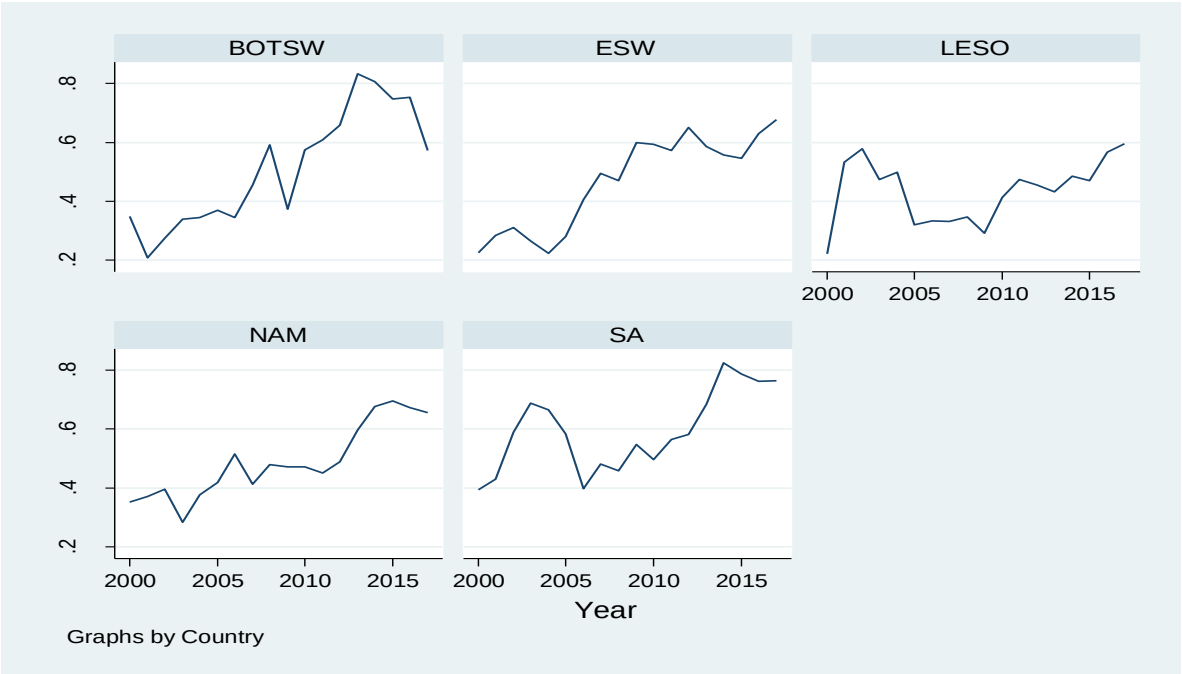

Figure 6.1: Line graph for SRII for individual countries

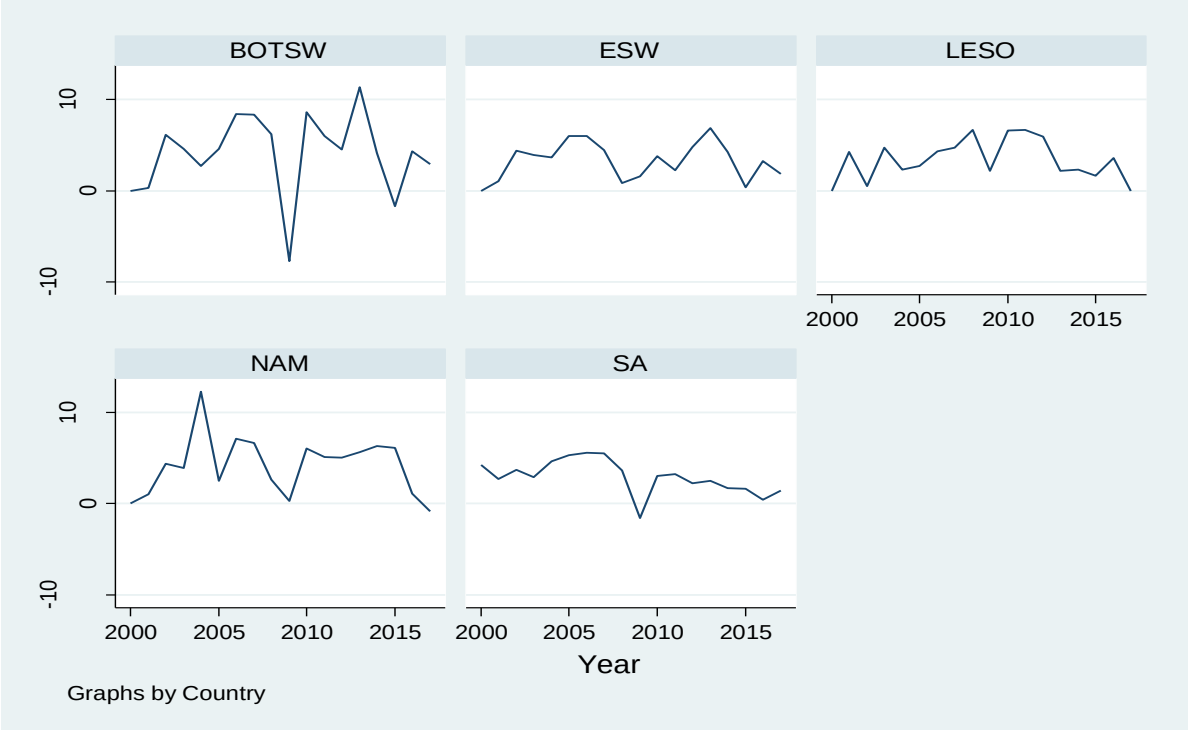

Figure 6.2: Line graph for RGDPG for individual countries

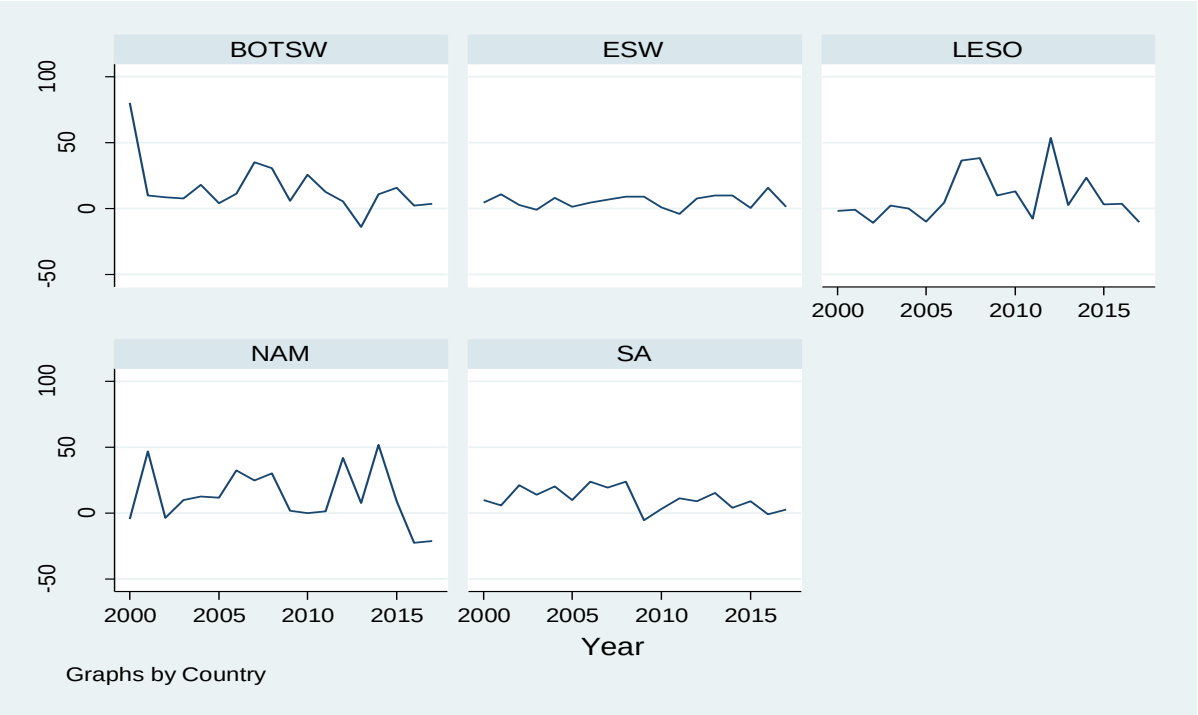

Figure 6.3: Line graph for GCFG for individual countries

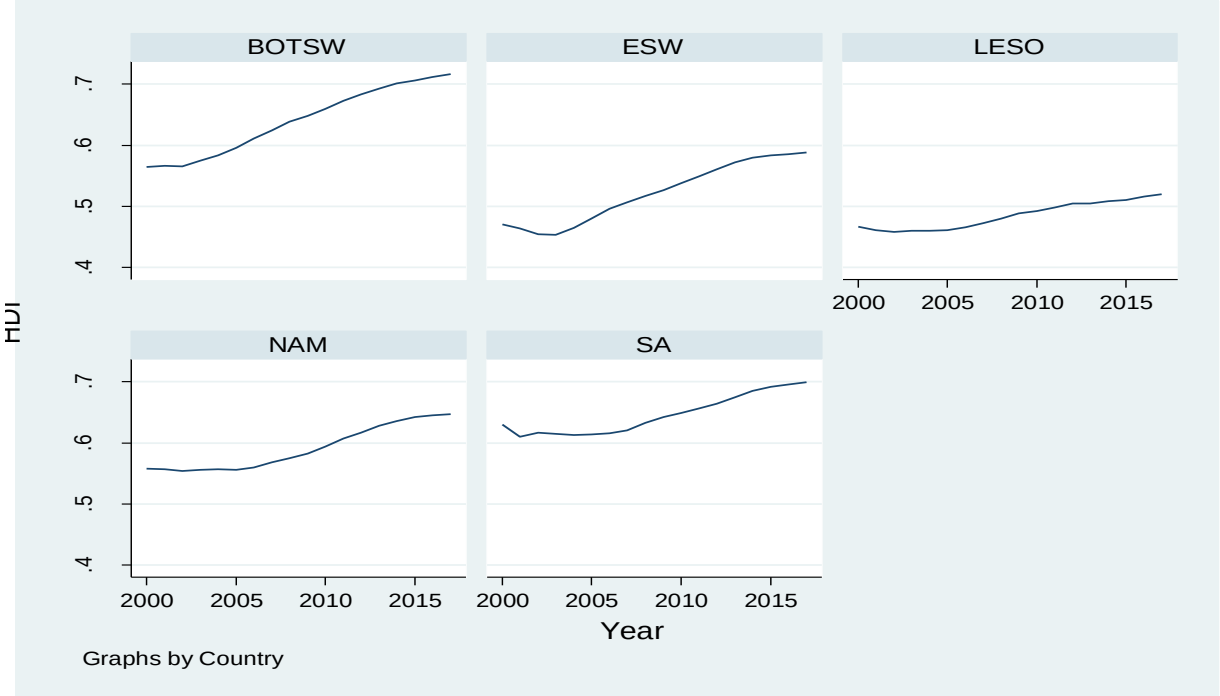

Figure 6.4: Line graph for HDI for individual countries

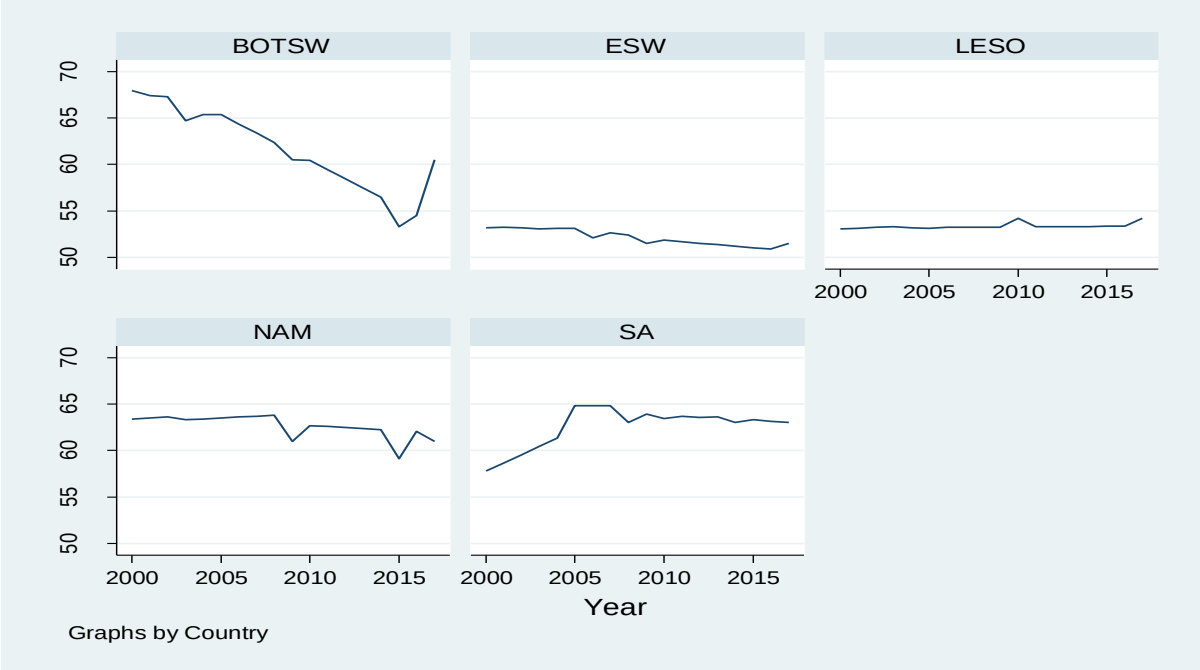

Figure 6.5: Line graph for Gini for individual countries

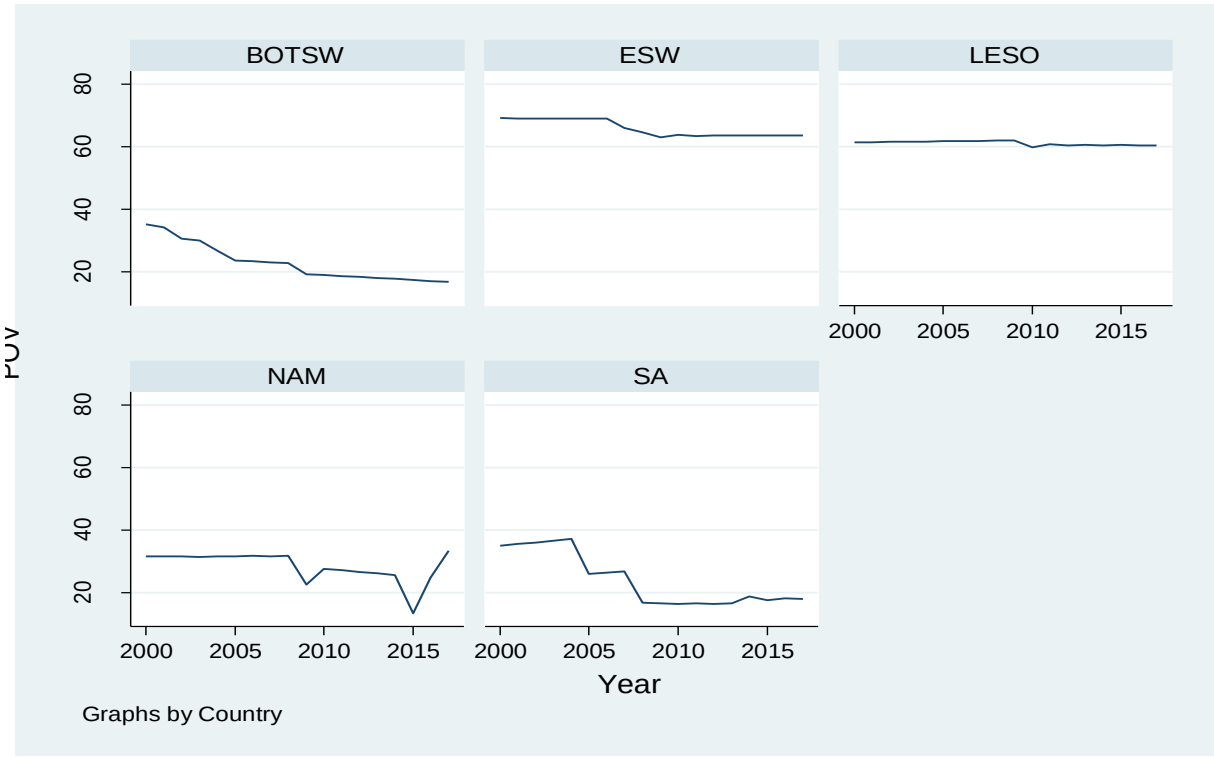

Figure 6.6: Graph for poverty for individual countries

6.2.3 SACU pooled time-series data descriptive statistics

This section gives an overview of the dispersion and variation of data series. Table 6.2 indicates that time-invariant variables like SRII and HDI have positives between variation and almost close zero within variation. Whilst poverty and Gini have more between variation (21.15 and 5.24, respectively) than within variation (5.16 and 2.45). GCFG has between a variation of 3.8, less than the within variation (15.58). The average poverty rate of SACU countries is between 22% and 66% across countries. Whilst HDI varies between 48% and 65% across SACU countries.

Table 6.2: Descriptive statistics of the data series

Variable	Variation	Mean	Std. Dev.	Min	Max	Observations
SRII:	Overall	0.4987387	0.1543103	0.2082652	0.8332157	N = 90
	Between		0.0605989	0.4345798	0.5944856	n = 5
	Within		0.1443637	0.1957133	0.8206638	T = 18
RGDPG:	Overall	3.572333	2.877572	-7.7	12.27	N = 90
	Between		0.5384267	2.927222	4.177778	n = 5
	Within		2.836529	-8.210444	11.66456	T = 18
GCFG:	Overall	10.54711	15.95463	-22.33	80.02	N = 90
	Between		3.799575	5.441667	15.22111	n = 5
	Within		15.58432	-24.56956	75.346	T = 18
HDI:	Overall	0.5768444	0.0756439	0.454	0.717	N = 90
	Between		0.071433	0.4851111	0.646	n = 5
	Within		0.0399249	0.5017889	0.6537889	T = 18
Gini:	Overall	58.46867	5.219601	50.9	67.935	N = 90
	Between		5.23648	52.16456	62.62829	n = 5
	Within		2.249707	50.14493	64.77993	T = 18
POV:	Overall	40.46823	19.71852	13.4	69.13354	N = 90

Between	21.15986	22.92609	65.83328	n = 5
Within	5.157881	25.41547	53.58097	T = 18

Source: based on the data series, 2000 - 2017

The study used OLS (*T = 18, N = 5*, a total of 90 observations) to obtain a single intercept coefficient and a single slope coefficient for each of the explanatory variables. The panel can generate a more reliable estimate than the ARDL based descriptive statistics for individual countries discussed in the previous section. The next section provides detailed results from the three models, indicating the FE model with pooled country dummies (LSDV), fixed effects and REs. The comparison is essential for model adequacy.

6.2.4 Stationarity tests

When dealing with time-series data, before the causal relationships are tested, the variables are first tested for stationarity. The objective was to avoid spurious results. For this purpose of this study, the panel unit root tests for stationarity were applied using the LLC approach as explained in the methodology section. The null hypothesis, $H_{O,}$ states that panels contain unit roots and the alternative, H_a, states that panels are stationary. The stationarity tests results are presented in Table 6.3.

Table 6.3: LLC test for unit root

Variable	**LLC results (in levels)**	
	Adjusted *t-statistic*	**Probability**
SRII	-0.8800	0.0819**
RGDPG	-2.6233	0.0044*
GCFG	-0.9047	0.0802**
HDI	-2.727	0.0191*
Gini	-1.7609	0.0391*
POV	-3.6562	0.0001*

Note: the number of panels (N) = 5 and the number of periods (T) = 18. Asymptotics: N/T -> 0. The number of lags on the ADF regressions = 1, the Bartlett kernel, 8.00 lags average chosen by LLC.

Therefore, under the hypothesis $H_0: \delta = 0$, the asymptotic results in the study indicates that the regression t-statistics (t_δ) has a standard normal limit distribution.

From Table 6.3 we deduce that the Levin-Lin-Chu bias-adjusted *t* statistic for SRII is −0.8800 and GCFG is -0.9047, are significant at 10% testing levels. Therefore, we reject the null hypothesis and conclude that the series is stationary. The Levin-Lin-Chu bias-adjusted *t* statistic for RGDPG (-2.6233), HDI (-2.727), Gini (-1.7609) and POV (-3.6562) are significant at all the usual testing levels. Therefore, we reject the null hypothesis and conclude that the series is stationary.

6.3 POOLED ESTIMATES MODELS RESULTS

This study aimed at establishing the effect of regional integration (SRII) on different socio-economic variables (RGDPG, GCFG, GINNI, HDI and POV). The results presented in this section are based on the model described in the methodology chapter. In total, 18 equations are estimated. This includes the six LSDV, six FE and six REs, based on the iterating interchange of the dependent variable. The interchanging of dependent variables is crucial because it enables to infer on the major determinant of regional integration amongst the five SACU countries. The summarised results of the models run based on the three (3) panel data techniques on each variable are presented in the following sub-sections.

6.3.1 SRII results of LSDV, fixed effects and random-effects model

Results presented in Table 6.4 indicate that higher values of HDI and Gini are associated with higher values of SRII for all estimators. Gini is significant for some estimators (random estimation) and not for others (pooled OLS and fixed effect). From the Table 6.4, it is deduced that both pooled OLS, fixed and random results across countries and over time, indicate that an increase in HDI in each time period leads to 3% increase in the ability to integrate within the SACU region. The results indicate that for Lesotho (combined effect of 3. 26 = 3% +0. 26%, Namibia (combined effect of 3.12% = 3% + 0.12%), Eswatini (3.17% = 3% + 0.17%) and South Africa (3.07% = 3% + 0.07%), considering that Botswana is the reference point in the model. South Africa remains the pacesetter for the SACU region, and the result is significant. Further, the RE indicates that improvement in Gini coefficient reduced the desire to integrate in

SACU. The REs results have indicated that the SRII is reducing as the levels of inequalities are reducing. The argument for this finding implies that countries with more balance income equality, be developed nations and have inward-looking policies.

Table 6.4: Model 1 results dependent variable SRII

Variable	Pooled OLS	Fixed Effects	Random Effects
GCFG:	-0.00033675	-0.00033675	0.00053804
HDI:	2.9229164***	2.9229164***	2.1791782***
Gini:	-0.00630345	-0.00630345	0.01285272**
POV:	0.00172804	0.00172804	0.00139522
RGDPG	0.00435975	0.00435975	0.00338094
LES	0.2589239**		
NAM	0.1156771***		
ESW	0.16533299		
RSA	0.07336096*		
Constant	-1.0233873*	-0.90072833	0.06969184
Observation (N)	90	90	90

Note: Botswana is a reference; therefore, it does not appear under country dummy.
*Note that *, **, *** denotes p<0.05; ** p<0.01; *** p<0.001*

Table 6.5: Model 1 performance results dependent variable SRII

Variables	Pooled OLS	Fixed Effects	Random Effects
R2	0.6984	0.698	
Adjusted R^2		0.664	
R^2-within	0.6984	0.698	0.684
R^2-between		0.769	0.672
R^2-overall	0.736	0.573	0.649
Sigma u (α)		0.973	0
Sigma ε	0.084	0.084	0.083
Rho (ρ)		0.575	0
Theta (θ)			0

Table 6.5 results indicate that HDI explains the dependent variable (SRII) regional integration index in both models, and to some extent, it is significantly explained by

the Gini index in the REs equation. It can be deduced that both models provide inconclusive results. We, therefore, follow up on the model by interchanging the dependent variable from SRII to RDGPG in the next step in Model 2 to determine the explanatory factor for regional integration.

6.3.2 RGDPG results of LSDV, fixed effects and random-effects model

Results presented in Table 6.6 indicate that only GCFG is associated with higher values of real GDP for all estimators. GCFG is significant for some estimators (fixed and random estimation) but not for others (pooled OLS). This implies that the exogenous variables do insignificantly determine real GDP per specific country in SACU. From Table 6.6 it is deduced that both pooled OLS, fixed and REs results across countries and over time, indicate that real GDP is not jointly influenced by the country-specific factors. For brevity, this model is considered redundant in the analysis.

Table 6.6: Model 2 results dependent variable RGDPG

Variable	Pooled OLS	Fixed Effects	Random Effects
GCFG:	0.03723031	0.03723031**	0.03929043*
HDI:	-22.012872	-22.012872	14.941629
Gini:	-0.05130674	-0.05130674	0.02837256
POV:	-0.03277987	-0.03277987	-0.04929782
SRII:	5.2281263	5.2281263	3.1482562
LES	-2.6206603		
NAM	-0.53918174		
ESW	-1.8709073		
RSA	1.2148147		
Constant	18.845688	17.596575	13.860672
Observation (N)	90	90	90

*Note that *, **, *** denotes p<0.05; ** p<0.01; *** p<0.001*

Table 6.7 indicates the performance of the models. Rho is a measure of the proportion of variation due to the individual-specific term. From Table 6.6, it can be deduced there is a significant proportion (18%) explained by the individual-specific term and the rest is due to an idiosyncratic error for the pooled OLS and RE. Theta is 0%, so the RE estimates are not much closer to the within estimates than to the OLS estimates. The R-squared indicates the between estimator can explain less than 10% of the between variation, and the fixed and REs estimators can explain 5% and 10%, respectively of within variation. The Hausman test indicates significant differences between the coefficients for the FE and REs model. Therefore, a need exists to use the FE model. Some estimators do not provide coefficients for time-invariant regressors.

The dependent variable RGDPG is significantly explained by capital formation (GCFG) in the fixed effect model (significant at 0.01%) and random effort (significant at 0.001%). We, therefore, follow up on the model by interchanging the dependent variable from RGDPG to GCFG in the next step in Model 3 to determine the explanatory factor for regional integration.

Table 6.7: Model 2 performance results dependent variable RGDPG

Variables	Pooled OLS	Fixed Effects	Random Effects
R2	0.089		
Adjusted R^2	-0.0129		
R^2-within		0.063	0.076
R^2-between		0.034	0.0.24
R^2-overall		0.02	0.062
Sigma u (α)		1.041	0
Sigma ε	0.084	2.896	2.896
Rho (ρ)		-0.114	0
Theta (θ)			0

6.3.3 GCFG results of LSDV, fixed effects and random-effects model

Results presented in Table 6.8 indicate poor model adequacy when GCFG is the dependent variable. From this dependent variable (GCFG) regional integration index is insignificantly explained by the choice of an exogenous variable. For brevity, these results are not explained here. Therefore, a follow up on the model is made by

interchanging the dependent variable from GCFG to HDI in the next step in Model 4 to determine the explanatory factor for regional integration.

Table 6.8: Model 3 results dependent variable GCFG

Variable	Pooled OLS	Fixed Effects	Random Effects
HDI	71.316162	71.316162	45.541508
Gini	1.4253436	1.4253436	1.3497733
POV	0.65678841	0.65678841	0.30643899
SRII	-11.512129	-11.512129	14.193419
RGDPG	1.0613525	1.0613525	1.1130856*
LES	-9.2429469		
NAM	-4.3704077		
ESW	-15.740419		
RSA	-4.6121069		
Constant	-131.76501	-138.55818	103.94125
Observation (N)	90	90	90

*Note that *, **, *** denotes p<0.05; ** p<0.01; *** p<0.001*

Table 6.9: Model 3 performance results dependent variable GCFG

Variables	Pooled OLS	Fixed Effects	Random Effects
R2	0.155		
Adjusted R^2	0.061		
R^2-within		0.115	0.108
R^2-between		0.743	0.711
R^2-overall		0.057	0.136
Sigma u (α)		5-976	0
Sigma ε	0.084	15.463	15.463
Rho (ρ)		0.129	0
Theta (θ)		0	0

6.3.4 HDI results of LSDV, fixed effects and random-effects model

Model 4 results indicate that HDI is explained better by Gini, poverty and the composite index for economic integration. Economic integration is associated with higher values of Gini and poverty attributes across the SACU individual countries. Gini, poverty and SRII are significant in all the models, (pooled OLS, fixed effect and RE). From Table 6.10, it is deduced that both pooled OLS, fixed and random results across countries

and over time, indicate that an increase in regional integration by a unit increases HDI by 1.4 to 1.5 %. The ability to integrate within the SACU region for Lesotho is (combined effect of 0.009%), Namibia (combined effect of 0.0029%), Eswatini (0.0026%) and South Africa (0.00036%), considering that Botswana is the reference point in the model. South Africa remains the pacesetter for the SACU region, and the result is significant at the 0.001 significance level.

Table 6.10: Model 4 results dependent variable HDI

Variable	Pooled OLS	Fixed Effects	Random Effects
Gini	-0.00344796**	-0.00344796**	-0.00276518*
POV	-0.00344796**	-0.00281064***	-0.00345422***
SRII	0.1467203***	0.1467203***	0.15893133***
RGDPG	-0.00092144	-0.00092144	-0.00117026
GCFG	0.00010472	0.00010472	0.00012591
LES	-0.06478941**		
NAM	-0.02624036***		
ESW	-0.02304566		
RSA	-0.00054568		
Constant	0.84411997***	0.82119575***	0.80189408***
Observation (N)	90	90	90

*Note that *, **, *** denotes p<0.05; ** p<0.01; *** p<0.001*

From Table 6.10, a considerable proportion (80%) is explained by the individual-specific term and none is due to idiosyncratic error for the pooled OLS and RE. Whilst 94% explains the individual-specific term and the rest is due to idiosyncratic error in the pooled OLS model. Theta is 0%, so the RE estimates are not much closer to the within estimates than to the OLS estimates. The R-squared indicate the between estimator can explain 94% and 93% of the between variation for fixed and REs. The fixed and REs estimators can explain 80% and 79%, respectively of within variation.

Table 6.11: Model 4 performance results dependent variable HDI

Variables	Pooled OLS	Fixed Effects	Random Effects
R2	0.9449		
Adjusted R^2	0.9686		
R^2-within		0.8020	0.7984
R^2-between		0.9452	0.9343
R^2-overall		0.8819	0.8937
Sigma u (α)		0.0264	0
Sigma ε	0.084	0.0187	0.1873676
Rho (ρ)		0.6652	0

6.4 Gini RESULTS OF LSDV, FIXED EFFECTS AND RANDOM EFFECTS MODEL

Results presented in Table 6.11 indicate that higher values of POV and HDI are associated with higher values of Gini for all estimators. POV is significant at 0.05 level for some estimators (pooled OLS and for the fixed effect) and at 0.01 level in the RE. From Table 6.11, it is deduced that both pooled OLS, fixed and random results across countries and over time, indicates an increase in poverty index in each period. This leads to a 1% decrease in the inequality levels in the SACU region.

SRII is only significant in REs estimations where it is positively influencing inequalities by 7.56% per unit increase. Same results indicate that for Lesotho, the combined effect of HDI on inequality is -41.96% (-32.61% + (-9.348) and human development index combined effects for Eswatini is -41.31% = (32.61% + (-8.702%). The combined effect of poverty on inequality is -9.45% (-0.1065% + (-9.348)) and HDI combined effects for Eswatini is -8.81% (-0.1065% + (-8.702%). Meanwhile, results for Namibia and South Africa remain statistically insignificant. The results for Lesotho and Eswatini indicate the vulnerability of regional integrations for small nations and hence their desire to disintegrate with SACU. The argument for this finding implies that countries with income equality, are developed nations and have inward-looking policies.

Table 6.12: Model 5 results dependent variable Gini

Variable	Pooled OLS	Fixed Effects	Random Effects
POV	-0.1065149*	-0.1065149*	0.31318004***
SRII	-2.9927761	-2.9927761	7.5663635**
RGDPG	-0.02031352	-0.02031352	0.01793734
GCFG	0.01979554	0.01979554	0.03012163
HDI	-32.612461**	-32.612461**	22.320206*
LES	-9.3483229***		
NAM	-0.02148678		
ESW	-8.7020484***		
RSA	1.5546011*		
Constant	86.251299***	82.947848***	87.537816***
Observation (N)	90	90	90

Note that *, **, *** denotes p<0.05; ** p<0.01; *** p<0.001

Table 6.13 indicates the performance of the models. Rho is the proportion of variation due to the individual-specific term. From Table 6.13, it can be deduced there is an insignificant proportion (89%) explained by the individual-specific term and none is due to idiosyncratic error for the pooled OLS and RE. Whilst 89% explains the individual-specific term and the rest is due to an idiosyncratic error. Theta is 0%, so the RE estimates are not much closer to the within estimates than to the OLS estimates. The R-squared indicate that the between estimator can explain 69% of the between variation, and the fixed and REs estimators can explain 69% and 68%, respectively of within variation. The Hausman test indicates significant differences between the coefficients for the FE and REs model. Therefore, a need exists to use the FE model. Some estimators do not provide coefficients for time-invariant regressors.

Table 6.13: Model 5 performance results dependent variable Gini

Variables	Pooled OLS	Fixed Effects	Random Effects
R2	0.8904		
Adjusted R^2	0.8781		
R^2-within		0.4103	0.2386
R^2-between		0.0024	0.9650
R^2-overall		0.0693	0.8198
Sigma u (α)		5.2678	0
Sigma ε		1.8222	1.8222
Rho (ρ)		0.8931	0

6.4.1 POV results of LSDV, fixed effects and random-effects model

Results presented in Table 6.14 indicate that lower values of HDI and Gini are associated with higher values of poverty (POV) for all estimators. Both HDI and Gini variables are significant in all three models. HDI is significant at 0.001% across all models for country-specific, whilst Gini is statistically significant at 0.005 level in a pooled OLS and fixed effect model, respectively. Meanwhile, Gini remains statistically significant at the 0.001 level in the REs model.

Based on the findings presented in Table 6.14, it is deduced that both pooled OLS, fixed and random results across countries and over time, indicate a decrease in HDI in each period. This leads to an increase in poverty within the SACU region. For example, the combined effect for Lesotho is 94.56 (-112% +17.44). For Eswatini the combined effect is 86.208 (-112 + 25.792), whilst the rest of the SACU's three better-performing economies, the HDI and Gini remain statistically insignificant, considering that Botswana is the reference point in the model. The argument for this finding implies that countries (Lesotho and Eswatini) with lower HDI and extremely high Gini coefficient is less developed nations and have inward-looking policies.

Table 6.14: Model 6 results dependent variable POV

Variable	Pooled OLS	Fixed effects	Random effects
SRII	3.4838303	3.4838303	4.7982554
RGDPG	-0.05510935	-0.05510935	0.18206896
GCFG	0.03873295	0.03873295	0.03994941
HDI	-112.88471***	-112.88471***	162.88229***
Gini	-0.45229064*	-0.45229064*	1.829544***
LES	17.438564***		
NAM	0.63535624		
ESW	25.79209***		
RSA	2.0149759		
Constant	120.90461***	130.0808***	239.23296***
Observation (N)	90	90	90

*Note that *, **, *** denotes p<0.05; ** p<0.01; *** p<0.001*

Table 6.15 indicates the performance of the models. From Table 6.15, it can be deduced there is an insignificant proportion (96%) explained by the individual-specific term and none is due to idiosyncratic error for the pooled OLS and RE. Whilst 96% explains the individual-specific term and the rest is due to an idiosyncratic error. Theta is 0%, so the RE estimates are not much closer to the within estimates than to the OLS estimates. The R-squared indicate that the between estimator can explain 41% of the between variation, and the fixed and REs estimators can explain 39% and 97%, respectively of within variation. The Hausman test indicates significant differences between the coefficients for the FE and REs model.

Table 6.15: Model 6 performance results from dependent variable POV

Variables	Pooled OLS	Fixed Effects	Random Effects
R2	0.967	0.5235	
Adjusted R^2	0.964	0.4700	
R^2-within		0.4103	0.3911
R^2-between		0.0024	0.9741
R^2-overall		0.0693	0.9262
Sigma u (α)		11.7557	0
Sigma ε		3.7549	3.755
Rho (ρ)		0.9074	0

The computed p-value is greater than the 0.05 level. Therefore, in comparing the fixed and RE, the test indicates that using the fixed effect is better because it yields similar coefficients with pooled OLS. Based on this, the dependent variable (poverty) level is significantly explained by HDI and Gini in both models. The combined effects are higher in Lesotho than Eswatini. It is, therefore, concluded that FE pooled OLS (LSDV) results in yield better explanation compared to the fixed and REs models.

6.5 CROSS-SECTIONAL DEPENDENCE OR CONTEMPORANEOUS CORRELATION TEST

Table 6.16 infers there is no cross-sectional dependence because the probability value (0.2202) of B-P (LM) test is more significant than the 0.05 level. Cross-sectional dependence is a problem in macro panels with long time series.

Table 6.16: Performance results on the correlation matrix of the residuals

Residuals	ε_1	ε_2	ε_3	ε_4	ε_5
ε_1	1.0000				
ε_2	-0.2081	1.0000			
ε_3	-0.0771	-0.1979	1.0000		
ε_4	-0.5292	-0.1197	-0.2183	1.0000	
ε_5	0.0303	0.4249	-0.0614	-0.3316	1.0000

The above results conform to the Pesaran's test of cross-sectional independence = -1.728, with the probability value of 0.0839. The average absolute value of the off-diagonal elements = 0.220 (no cross-sectional dependence).

6.6 CHAPTER SUMMARY

This chapter presents the research findings on the effect of regional integration on socio-economic development in SACU countries. First, the descriptive measures of the variables of interest are presented and discussed. This is followed by the presentation and discussion of the panel analysis outcomes from the FE with pooled country dummies. This generates the least square dummy variables estimation, the FE, and the REs models. The research findings reveal that regional integration positively affected the HDI, Gini, whilst reducing poverty levels in the SACU region. The effect on economic growth and gross capital formation is insignificant. An interrelationship exists amongst the variables, such that regional integration may influence growth rates and investments through its influence on the other variables.

CHAPTER 7: CONCLUSIONS AND POLICY RECOMMENDATIONS

7.1 INTRODUCTION

Regional integration is increasingly becoming popular and a priority globally (Motelle & Biekpe 2015). This phenomenon continues to be a significant driver of socio-economic development. It was received as a remedy or solution for most emerging problematic politics, social and economic related issues challenging most developing nations (Ahmed 2016). Other challenges that can also be addressed by regional integration include slow growth in economic output, increasing lack of basic necessities and high divergences in social classes. This is due to unequal access to opportunities and income, food shortages, and stumpy unemployment levels.

According to the AfDB (2015), this engagement has vast potential to increase economic growth and poverty alleviation, whilst reducing inequalities between countries. Regional integration is considered beneficial because of accelerated investments and output growth, economies of scale, reduction in regulatory barriers, encouraging trade amongst the member states in the same region. (Mathews 2003)

Regional integration processes differ globally and more particularly in Africa, due to differences in operating environments, policies, and institutions. The literature review revealed that many researched works investigated the effect of this process on the growth of the economy, trade liberalisation, financial markets integration, and development, addressing inequalities. This includes poverty alleviation, not necessarily the socio-economic development. These economic, social, commercial, and environmental influences were individually assessed in previous studies. The commonly established results indicated a positive relationship despite the various indicators and methodologies applied by various researchers. Studies on the effect of regional integration on the socio-economic development remain limited, especially from the developing economies perspective.

Regional integration has variously been measured in literature. The variables commonly used to measure regional integration include average tariffs; trade ratios;

trade openness; exports; imports; terms of trade, financial openness, exchange rates, multilateral trade; domestic trade inflows; international trade inflows, average applied statutory tariff rates; average applied collected tariff and total tariff revenue as a percentage of GDP. Therefore, it can be concluded, there are no universally agreed variables that could be used to measure regional integration and its influence. Studies on the effect of regional integration on the socio-economic development remain limited, especially from the developing economies perspective.

Manwa (2015) notes that a growing stream of literature focused on western countries unions. Not much research was conducted in Africa, specifically in the SACU region. The commonly studied African blocks are the COMESA, the EAC, the ECOWAS and the SADC. SACU region has not been an area of interest despite it being one of the oldest blocks. Although South Africa is the second-largest economy in Africa, inadequate research was conducted regarding regional integration (Manwa & Wijeweera 2016).

Basdevant et al (2012) notes that research on this subject in the SACU context is dominated by its effect on inequalities. Conclusively, regional integration influences differ based on the varied contexts and the scenarios around the countries or block. This explains to researchers that investigations based on the SACU region or individual member states should be conducted to establish the potential benefits derived from being a member of a regional block. The study, therefore, focused on establishing the effect of regional integration on socio-economic development in the SACU region.

Besides the measurement issue, Manwa (2015) notes that a growing stream of literature focused on western countries unions. Not much research was conducted in Africa, specifically in the SACU region. The commonly studied African blocks are the COMESA, the EAC, the ECOWAS and the SADC. SACU region has not been an area of interest despite it being one of the oldest blocks. Although South Africa is the second-largest economy in Africa, inadequate research was conducted regarding regional integration (Manwa & Wijeweera 2016).

The identified divergences in the literature and methodological issues along with the unresolved question on the effect of regional integration on socio-economic development justified this research. The thrust of the thesis was to assess regional integration effects on the social and economic status of the SACU member states. Provided that such an investigation has not been conducted before in the SACU countries, the present study adds to the body of knowledge on the SACU region.

The remaining sections are organised as follows: Section 7.1 provides the research conclusions. These are conclusions based on the comprehensive literature review covered in Chapters 2 and 3. Second, conclusions based on the index constructed are also presented. Third, conclusions on the effect of regional integration on socio-economic development are discussed. Section 7.2 discusses the contributions of the study; this provides contributions to literature, methodological contributions, and contributions to policy. Section 7.3 discusses the recommendations of the study.

7.2 CONCLUSIONS OF THE STUDY

The main research objective of this study was to analyse and evaluate the effect of regional integration on socio-economic development in SACU countries. Due to the complexity of the socio-economic development concept, the main objective was subdivided into the secondary objectives as follows:

- Objective 1

To evaluate the effect of regional integration on various social and economic development factors.

- Objective 2

To evaluate the effect of regional integration on socio-economic development by:

- Examining the effect of regional integration on economic growth
- Analysing the effect of regional integration on gross fixed capital formation growth
- Analysing the effect of regional integration on the HDI
- Analysing the effect of regional integration on inequality levels
- Analysing the effect of regional integration on poverty reduction

- Objective 3

Provides policy recommendations to the socio-economic problems encountered by the member countries, based on the study findings.

- Objective 4

Implementing the proposed SRII as a way of providing policymakers with accurate regional integration impacts

7.2.2 Conclusions regarding the literature review

7.2.2.1 Theoretical literature review

This study concludes that its restricted nature limits the SACU region's capacity to benefit from regional integration as a CUs. According to the definitions in African regionalism theory, SACU can be concluded to be economically integrated only. The African regionalism theory states the different forms of regionalism include functionalism, political and economic. Political regionalism refers to an agreement where the primary objective is to enhance the collective bargain of member states as one group which cannot be gained if they operate individually.

Functional regionalism is a regional collaboration on specific issues, for example, the most common ones in Africa being the river basins, transportation links and meteorology and the generation of improved infrastructure through regional economic gains. These two forms are not evident in SACU's engagements. Evidenced are the collaboration efforts of the countries to promote free trade. This category includes FTA, CUs, CM, and economic union. Therefore, this leads to the conclusion that SACU countries, being in CUs is not open like countries that have opened to economic, functional, and political regionalism. The outcome of this research may help policymakers to consider expanding or improving SACU from just being a CUs to other forms or functions.

Relating the operations of SACU to reviewed literature, the SACU region is hanging in between the shallow and deeper integration. Shallow integration is the agreement to allow free trade, which leads to trade flow shifting. This is accrued from the country

that used to produce at a higher cost to the one where production can occur cheaply, and imports being diverted from a country that produces cheaply. This is not part of the agreement to one that produces at high costs part of the integration agreement. SACU regions achieved shallow integration by removing the tariffs. Whilst deep integration involves implementing structures, institutions and policies enhancing trading activities by lessening the regulatory requirements and (Evans et al 2004) the other hindrances inside the country which could be both formal and informal. This study notes there are still numerous non-tariff barriers which could be eliminated. Additionally, there are still administration and regulatory barriers inside the countries hindering the CU policies to be fully implemented. These issues hinder the effectiveness of the CU in improving the socio-economic status of the countries in the region.

Long in CU history, Viner (1950) established that the motives behind customs union formation include benefiting from comparative advantage. Comparative advantage theory advocated for global free trade to enhance consumer and producer benefits from purchasing from the cheapest suppliers. The emergence of the industrial growth motive in most developing countries in line with the SDGs achievements, this theory seems to be defeated by infant industry protection policies introduced. Most developing countries focus on indigenisation and economic empowerment of local citizens in each country, such that the use of comparative advantages is hindered.

Foreign supply on some products is eliminated and promoting local production despite that they would have produced at excessive costs. Export-oriented producers encounter the same disadvantage as they cannot freely access markets outside their country. A comparative advantage would be possible as the production would be set in those places where the factors of production are cheaply available, and final goods would be freely distributed to all other places. This is not the case in SACU countries, and not all products can freely flow around the region due to infant industry protection policies. Countries have specified some products and services that cannot be allowed to be imported, especially those that local citizens can produce. Conclusively, the infant industry protection adopted by SACU countries distorts the initial motives of the formation of CUs. Therefore, to fully benefit from the benefits of a CUs, a need exists for a policy trade-off.

7.2.3 Empirical literature review

regional integration influences differ based on the diverse contexts and the scenarios around the countries or block. Many theoretical and empirical studies conducted in this context concentrated more on economic growth, growth convergence, financial and stock markets development, addressing income inequality, poverty alleviation and food security. This study concludes that the socio-economic effect of regional integration is silent, especially from the perspective of developing economies. This study is more relevant to the recent development theory, which encompasses both the economic and socio aspects of nations' well-being.

This study also concludes that literature is lacking especially in the SACU region. Therefore, this study is one of the few studies that focused on the effect of regional integration in the SACU countries.

Based on the empirical literature review, this study concludes that there are no agreed standard measures of regional integration across the literature. This resulted in different measurement constructs implemented to measure the impacts of regional integration. The various indicators of regional integration did not help to develop the discourse but instead made the debate and the subject area more complicated. Regional integration was represented by various indicators. These include average tariffs; trade ratios; trade openness; exports; imports; terms of trade, financial openness, exchange rates, multilateral trade; domestic trade inflows; international trade inflows, average applied statutory tariff rates; average applied collected tariff and total tariff revenue as a percentage of GDP in reviewed studies.

These single indicators did not capture the broader scope of regional integration except the trade component. The real picture of how regional integration effect on any factor cannot be comparable and agreed on. This leaves literature with a divergence in the comprehensive measure of regional integration, specifically in the SACU region.

Several common measures for regional integration have been constructed in some other regional groupings, but none has been developed for SACU countries. With regional integration being a global concern, different RECs in the various parts of the world developed composite measures suitable for their setups and environment.

The most common measures include the EURII for the Arab world, APRII and the ARII. The measure closer to the context of the SACU region is the ARII, applying to most African blocks. Some of the ARII's dimensions and indicators were adopted in the SRII, constructed in this study. This study concludes there is no composite measure of regional integration constructed for the SACU region.

7.2.4 Conclusions based on the constructed SRII

The index constructed in this study revealed that SACU countries are dominated by trade and productive integration. Between 2000 and 2005, Botswana and Lesotho had an equal contribution from the two dimensions to the overall integration levels. In South Africa, Namibia and Eswatini production integration were the highest followed by trade integration. This study concludes there was a lack of financial and macroeconomic policies harmonisation and infrastructure integration, as these two dimensions were shallow in all countries.

SACU region is lagging concerning the financial and macroeconomic policies integration. As time progressed from 2012 onwards, there were more developments in infrastructure integration with increased trade integration. All the SACU countries improved in the first three dimensions. The challenge remains with the financial and macroeconomic policies integration. There is a noticeable decline, especially in Botswana, Lesotho and Namibia, their financial and macroeconomic integration indexes have lowered. South Africa and Eswatini are the only countries showing improvement in the financial and macroeconomic integration.

7.2.5 Conclusions on the effect of regional integration on socio-economic development

7.2.5.1 To evaluate the effect of regional integration on economic growth

The study revealed that an increase GCFG can boost real economic growth by 3.7% and 3.9% in the FE and RE, respectively. This is the only variable which proved significant in the analysis. These results imply that real GDP per specific country in SACU is insignificantly determined by the other exogenous variables in the model. These results confirm the growth theories which posits that an increase in investments

in a country stimulates industrialisation which leads to an increase in output and productiveness in an economy. The literature reviewed has also indicated that the SACU countries RGDP are not even and indicates to be weakly performing.

As indicated in Figure 1.2, the SACU countries reflect a weaker trend in GDP growth rates. These trends and the results prove that despite the countries being in the SACU region, their integration is insignificant to RGDP growth. Growth is subject to other external factors, such as the global financial crisis mentioned earlier, the world prices, and the level of industrialisation of the economy. Considering that the study used panel data, it can be concluded that regional integration may not have a sudden direct effect on real economic growth. Benefits may be realised through the influence of regional integration on other variables which will later spill over to increase economic.

7.2.5.2 To evaluate the effect of regional integration on gross fixed capital formation growth

The growth in investments (gross capital formation) reflects sustainability in the development process of the economy. From the index construction, the conclusion is that growth in infrastructure is little compared to other dimensions of regional integration. This saw regional integration being insignificantly impacting on the level of investments in the SACU countries. The REs estimations are the only ones showing some positive significant effect of RDGPG on GCFG. The trends indicate in Figure 1.4 reflects the average level of gross capital formation in the region with minor oscillations between the period 2000 to 2008. The years 2005, 2009, and 2013 noted the highest fall in gross capital formation irrespective of the levels of integration. The trends support the outcome of the analysis and they reveal that the economies' integration into SACU has not had any significant effect on the levels of investments in the economy. There is a need for policies to be implemented which can allow the region to maximise on the benefits of this union.

7.2.5.3 To evaluate the effect of regional integration on the HDI

The results from this analysis indicate that HDI is better explained by SRII, Gini and poverty. These three variables are significant in all models. This study concludes that regional integration has the potential to raise the HDI levels of SACU countries by 14%

to15% per unit increase. Higher values of HDI are associated with higher values of regional integration (SRII) in the SACU region. For the SACU countries to continually increase in their HDI, more integration efforts are required. There are other variables in the models that have a high effect on HDI, such as the levels of inequality and poverty. This is supported by the trends indicated in Figure 1.5. The trends reveal an increase in HDI across all countries since 2000. This can also be explained from the angle of the general awareness of inequality and poverty reduction initiatives, gender imbalances, and promotion of equal participation and empowerment in economic activities could have contributed to this. The MDGs and their development into the SDGs observed most developing economies tailor-making their policies towards achieving the development goals. These policies also encourage global partnerships towards development achievements. Therefore, this integration into SACU has a positive effect on developing the economies.

7.2.5.4 To evaluate the effect of regional integration on inequality levels

The results revealed that regional integration is highly correlated with inequalities in SACU countries. These results are supported by the findings by Basdevant et al (2012) and Manwa (2015) who also discovered that the SACU region exhibits extremely high levels of inequalities. This outcome is especially explained by the unequal opportunities in the SACU countries. The literature identified additional external factors, such as poor governance and corruption concerns, which may lead to unfair distribution of the benefits from regional integration. Another argument for this finding implies that countries with more balance income equality, are developed nations and have inward-looking policies. This study revealed that an improvement in Gini coefficient reduced the desire to integrate with SACU.

7.2.5.5 To evaluate the effect of regional integration on poverty reduction

The results from this analysis indicate that regional integration is insignificant in determining the poverty levels in the economies of the SACU region. The only significant variables are the HDI and the Gini. This research concludes that an increase in human development and reduced inequalities can lower the poverty levels in the SACU region. The results indicate the vulnerability of small nations and a desire

to integrate with SACU. The argument for this finding implies that countries with more balance income equality, are developed nations and have inward-looking policies. It can also be concluded from this study that the effect of regional integration on poverty is likely to be seen eventually. The analysis has indicated that regional integration impacts positively on HDI and HDI has a significant effect on poverty. Hence, poverty can be reduced through the effect on HDI levels in the SACU economies. The higher the HDI, the lower the poverty levels will be.

7.3 CONTRIBUTIONS OF THE STUDY

This section discusses the contributions of this research to the body of knowledge. It discusses the contribution to literature, the methodological contribution and policy contributions.

7.3.1 Literature contribution

First, this study contributes to the broader body of knowledge as it identifies the influences of regional integration on socio-economic development. The literature focusing on these two constructs is lacking in the SACU context. As concluded in the literature review, most researchers focused on developed nations and those that focused on developing countries have not explored the SACU region. This study fills the lack of literature by investigating in the SACU region.

Second, the SRII constructed in this study is a significant contribution to the study. There are no studies that could be established to develop a regional index before, in the empirical context of SACU economies. This index is handy for policymakers at any level in each country or regional level as it reveals the structure of integration levels of each member state. The index indicates the composition based on the four dimensions of trade integration, productive integration, infrastructure integration and macroeconomic and financial integration. Such a breakdown helps to evaluate the strengths and weakness of each country. It also helps in clarifying the focus areas if policies are to be developed or evaluated for the benefit of each economy.

The index is also useful as a policy tool for the SACU institution as it reviews and improves its plans and strategies for the region. Employing the developed index, the

SACU institution will be able to see each member states position and needs clearly. Third, the study is one of the few studies that have measured the effect of regional integration on socio-economic development comprehensively. As aforementioned, previous studies employed single indicators as proxies for the regional integration, and a sole indicator either for economic or for the social aspect. This study is comprehensive because it used a composite index for regional integration and assessed it against many indicators, including individual and composite measures.

7.3.2 Contributions to methodology

As noted from the empirical literature review, measurement of regional integration is not standardised. For example, researchers used single indicators, such as average tariffs; trade ratios; trade openness; exports; imports; terms of trade; financial openness; exchange rates; multilateral trade; domestic trade inflows; international trade inflows; average applied statutory tariff rates; average applied collected tariff and total tariff revenue as a percentage of GDP. Some composite indexes have also been developed in various parts of the world, suiting their unique setups and environments. Therefore, this resulted in diverse measurement constructs that cannot be universally applied. As such, this study also developed new proxies that the researcher felt were suitable for the SACU region with a combination of various indicators under various dimensions. These new proxies can be used in further research, therefore, enhancing methodological aspects in regional integration.

This study covered the whole SACU region observing each member country. The study also measured this causal relationship with diverse proxies. Compared to the empirical literature reviewed, this study is comprehensive from its use of many proxies both for regional integration and for socio-economic development concepts. This is a significant contribution to methodology.

On the calculation of the overall ARII index, a selective audit by Gor (2017) comments that in a structural sense, applying equal weights to the indicators implies an unequal weighting of the dimensions. Improving on the weaknesses emphasised in the ARII by UNECA (2016), this research applied the PCA procedure. Hur and Park (2017) recommend it as the most applied statistical method in the construction of the

composite index. Gwartney and Lawson (2001) said the PCA is only applicable in cases where each dimension is based on various aspects of the composite index. OECD (2008) recommends the same method as the most useful tool amongst the currently available weighting schemes, especially when the dimensions have a smaller number of indicators (from 0 to 10). This study improved on the methodological aspects regarding the construction of the index.

In assessing the relationship between regional integration and socio-economic development, this study applied the pooled OLS (LSDV), FE and RE models. This method has not been widely used in this area as revealed by empirical literature review. The commonly used methods are the generalised moment methods, factor analysis technique, gravity model and the partial equilibrium analysis.

7.3.3 Practical/ policy contributions

The SRII constructed in this study will help regional and countries' policymakers to identify priority areas for achieving their development goals. Based on the analysis of the results, the index revealed growth in infrastructure and trade at some point in time. This will help the countries to evaluate the policies implemented during the same period and have lessons for future references.

The findings of this research can be used to advance the implementation of the SDGs. Conclusions on specific objectives have emphasised on what needs to be improved or reduced to attain optimality in real GDP growth, trade openness, investments, human development, in lowering poverty and inequalities. Other variables have also been explained on how they should adjust for regional integration to improve.

This study motivates the need for global partnerships for development by revealing the importance of regional integration for socio-economic development.

Deficiencies in the SACU region that can be addressed to increase member state benefits from regional integration were emphasised. With the long-run equilibrium estimations conducted in this research, individual-specific policies can be developed along with the areas, and the whole region can be better off.

The index, with the identified relationship between regional integration and socio-economic development, can help in shaping individual countries specific policies.

7.4 RECOMMENDATIONS

This section proffers practical policy recommendations and recommendations for future studies.

7.4.1 Practical policy recommendations

The following practical policy recommendations are based on the study findings as:

7.4.1.1 Inclusive development strategies

Implement more inclusive development programmes which can accommodate people in different social classes, in various business sectors and across all the regions of the country. Development should be extensively distributed around the country to accommodate all industries and all types of people.

7.4.1.2 Promote private sector participation in economic activities

The member countries should implement financial reforms that can increase access to credit and financial services, improving availability of development and SMEs funding. More generally, the governments should implement a supportive business environment that encourages entrepreneurship, including increased efforts to address coordination and other market failures.

7.4.1.3 Policy focus on boosting productive capacity

Policies developed should focus on encouraging or promoting productive capacity development through infrastructure development, capital investments, human capacity development, Institutional transformation, and technological innovations. This will also enhance export competitiveness.

7.4.1.4 Integrate into the global economy to achieve its development strategies

SACU as a region or member states as individual countries should participate in global production networks for manufacturing. This will permit them to benefit from comparative advantage as they specialise in the production of specific tasks along the value chain of a product.

7.4.1.5 Take advantage of emerging economies:

The SACU countries should take advantage of the emerging economies in global trade and finance to diversify their export markets and increase their sources of development finance.

- Integrate the regional integration and trade into national and sectoral development plans:

Global and /or regional integration, especially trade should be integrated into national and sectoral development planning, policymaking, implementation and review coherently and strategically. Policy trade-offs should be cautiously exercised to avoid a clash of policies, such as integrating into global value chains and infant industries protection.

- Link trade and industrial policies

Trade policies should be linked to industrial policies; these policies should not be developed independently. There is a need for coherent policies, provided the linkages of these sectors.

- Policy focus on social welfare

This study recommends that the SACU countries should improve their labour, education and social protection and safety nets.

- Data management

One of the significant challenges encountered in this study was data unavailability. Two variables, the average costs of intraregional roaming, and the proportion of intraregional flight were excluded from the study because of data unavailability. There is a need for SACU countries to improve on data collection, records keeping and archiving for evidence-based policymaking.

7.4.2 Recommendations for future research

With data availability, this research can be extended to incorporate quarterly data or more years of study. This can increase the number of sample size and observations which can improve the outcome from the statistical and econometric analysis. In a bid to verify on some unexpected results obtained in this research, future research can use fewer proxies for effective modelling. This research suspect that complexity of proxies could have led to some results being insignificant at all, insignificance in the short-run whilst significant in the long run.

This study recommends further research on Eswatini. Most of the variables assessed indicated that regional integration had no significant impact, which contradicts the expected results that regional integration increases growth and improves living standards in an economy.

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APPENDICES

APPENDIX A: INDEX PANEL DATA

COUNTRY	YEAR	SGDPE	SGDPI	SGDPT	IDI	ETCP	IRGE	IRGI	MTCI	IRD
1	2000	17.04557	0.218338	0.118899	22.12	572.804	8.939137	0.444148	0.26	0.02
1	2001	4.609302	0.198132	0.031542	23.66	672.3896	2.350611	0.3523	0.25	-0.66
1	2002	7.640524	0.082482	0.061041	24.73	825.8645	3.87871	0.112733	0.29	-2.8
1	2003	6.415258	0.074789	0.056911	25.18	1036.391	3.467813	0.101639	0.3	2.02
1	2004	2.976913	0.024258	0.061467	28.45	1044.098	3.267138	0.05631	0.29	2.9
1	2005	3.7585	0.024973	0.096341	28.59	1066.895	4.502136	0.055832	0.28	4.04
1	2006	2.761423	0.024495	0.08245	28.21	1172.888	3.524626	0.05425	0.25	5.06
1	2007	3.205762	33.67729	-5.89117	28.98	1316.33	2.973459	32.81103	0.23	-0.52
1	2008	8.697224	41.38999	-3.77135	29.75	1402.625	7.236969	37.11808	0.22	1.46
1	2009	4.431372	41.813	-141.336	30.61	1409.175	3.247037	30.69749	0.17	0.44
1	2010	6.464661	42.6862	-7.23381	31.89	1483.97	4.526182	30.97223	0.24	2.12
1	2011	7.940656	46.68199	-9.54415	32.59	1530.708	5.192291	31.35703	0.24	2.38
1	2012	9.127186	52.22621	24.08446	33.5	1565.106	5.964463	33.73446	0.24	0.66
1	2013	21.92211	64.09815	-20.2884	34.76	1324.872	12.58361	37.23761	0.28	0.32
1	2014	19.20728	68.57855	54.19776	35.64	774.703	10.78108	38.29745	0.28	-0.82
1	2015	20.10662	60.82042	-3.87674	35.63	665.4001	10.8058	34.64159	0.29	-0.98
1	2016	22.76231	54.93444	-2.75838	36.61	742.1365	13.06163	33.78393	0.27	-3.16
1	2017	10.24751	48.31684	-13.1775	36.79	711.2745	6.395671	30.7092	0.25	-1.78
2	2000	11.08462	16.3033	-0.00982	11.9	5.351317	1.548233	8.83295	0.26	-2.38
2	2001	38.65867	23.98133	0.024301	12.24	21.20941	4.564877	9.873425	0.26	0.74
2	2002	18.26506	74.37349	-0.1144	12.83	10.51352	2.340814	25.6619	0.21	1.4
2	2003	7.806723	76.93277	-0.16362	12.89	20.854	1.112815	27.57053	0.21	-0.88
2	2004	11.67114	73.44966	-0.17182	13.17	15.51407	1.711311	22.77862	0.19	0.5
2	2005	10.075	49.66875	-0.15265	13.35	5.129407	1.803092	16.59056	0.06	-0.96
2	2006	7.257669	49.34969	-0.1893	13.56	20.34938	1.382963	16.31718	0.09	-0.24
2	2007	10.64429	39.14848	-1.29395	13.75	25.22339	2.318195	8.955715	0.04	1.58
2	2008	13.38583	35.54036	-0.56987	13.68	25.00088	2.483644	7.106897	0.17	-0.54
2	2009	14.12879	39.42231	-24.1526	13.96	59.42921	2.614641	7.309569	0.18	-1.76
2	2010	14.24043	38.05751	-1.2833	14.4	98.01274	2.689987	7.450169	0.2	-1.48
2	2011	12.37186	49.47926	-2.52474	14.42	125.9589	2.23425	9.179155	0.23	-0.12
2	2012	10.38769	49.0516	5.943404	15.11	148.3305	1.867297	8.715624	0.17	-1.34
2	2013	11.77787	60.81541	-5.55358	15.46	136.9629	1.591669	8.317884	0.12	-0.58
2	2014	8.967217	62.42261	12.99391	15.71	125.8281	1.11454	7.719066	0.16	-0.62
2	2015	9.345923	64.99314	-1.16682	15.69	119.5597	1.106053	8.151772	0.18	0.22
2	2016	17.47269	72.68855	-0.96537	15.68	167.8902	2.044541	9.115632	0.16	0.24
2	2017	17.66508	80.04642	-4.48123	16.01	183.5816	2.288074	10.55841	0.17	-0.58
3	2000	7.675192	25.68798	-0.14565	23.68	379.0956	0.046062	59.79924	0.18	1.72
3	2001	8.884507	28.46197	-0.15343	23.91	413.7369	0.049657	55.46596	0.16	2.94
3	2002	9.857567	30.1276	-0.1678	24.72	637.0573	0.051294	42.20723	0.2	1.9
3	2003	8.533469	23.34888	-0.14528	24.81	669.5075	0.050394	34.66568	0.18	0.02
3	2004	9.697885	31.30967	-0.26706	24.7	771.4406	0.063178	43.14076	0.17	0
3	2005	10.69008	28.94215	-0.31929	25.11	821.7711	0.08681	43.86571	0.19	-2.26
3	2006	10.60025	29.04637	-0.40614	25.72	929.1085	0.098888	47.01838	0.22	-1.54
3	2007	9.304929	31.3422	-4.51092	26.29	966.3856	0.091378	32.33048	0.17	-1.12
3	2008	13.96134	34.40339	-2.28018	26.76	996.9735	0.112332	29.83255	0.16	-2.14
3	2009	15.26935	46.80129	-128.193	25.11	963.9501	0.120306	36.94588	0.12	1.94
3	2010	9.070049	38.64612	-6.78273	28.88	1095.174	0.072922	32.1999	0.14	0.12

3	2011	12.70196	42.70063	-8.54011	26.05	1083.218	0.095978	33.14504	0.12	-1.12
3	2012	10.07355	43.43103	21.26547	27.83	1073.353	0.075098	32.00352	0.14	-0.14
3	2013	17.47313	49.33626	-15.5196	28.27	1217.343	0.101556	29.02104	0.13	0.02
3	2014	18.6172	56.88315	41.25752	28.74	1185.158	0.102635	31.19958	0.11	0.08
3	2015	21.08889	57.51201	-3.53549	28.8	1067.794	0.115536	33.3929	0.13	-0.68
3	2016	17.75803	56.64656	-3.07323	28.64	1197.719	0.093924	32.10983	0.15	0.74
3	2017	19.04675	49.79392	-9.88265	28.65	1203.728	0.110383	29.38721	0.13	1.02
4	2000	3.695713	0.000293	1.042777	46.66	2.866141	77.4009	0.023815	0.02	-3.08
4	2001	4.095395	0.000395	1.09926	46.52	5.389673	78.40618	0.02635	0.01	-1.66
4	2002	4.390566	0.000432	1.248279	46.07	19.56357	78.471	0.020786	0.01	-1.7
4	2003	3.630071	0.002682	1.264414	45.88	41.34423	76.20445	0.141542	0.01	-1.28
4	2004	3.245315	0.000306	1.38667	46.78	71.09192	73.11205	0.01457	0.04	-2.7
4	2005	2.493577	0.167229	1.444366	48.58	47.9306	71.86864	8.995685	0.06	-1.16
4	2006	2.453552	0.291159	1.621709	50.51	60.16459	77.96261	16.05347	0.05	-1.94
4	2007	2.812778	0.515249	13.0675	51.7	63.14247	76.75203	14.76808	0.07	-0.42
4	2008	2.908061	0.548652	8.015652	53.84	71.41139	71.26398	14.49032	0.09	-0.24
4	2009	2.999895	0.6055	311.8308	55.15	34.33337	75.71514	15.31205	0.09	-0.46
4	2010	2.947199	0.646888	17.49374	55.96	48.07631	78.57631	17.87351	0.11	-0.48
4	2011	2.894444	0.547866	23.21225	59.02	58.74079	75.99544	14.77679	0.17	-1.12
4	2012	2.901879	0.577183	-52.8026	78.97	94.90886	77.07852	15.15369	0.14	-1.24
4	2013	3.213931	0.71446	44.69639	73.81	83.69384	68.58075	15.42969	0.08	0.22
4	2014	3.458858	0.697442	-110.537	75.9	48.77193	70.79413	14.20228	0.07	0.88
4	2015	3.364111	0.724328	9.554432	75.52	28.03338	68.72249	15.68175	0.06	0.52
4	2016	3.230859	0.731343	7.823624	79.63	106.9347	67.68249	16.41966	0.1	0.34
4	2017	2.881327	0.801809	28.50472	78.53	106.4934	71.21286	20.18083	0.09	0.22
5	2000	14.03291	14.89383	-0.0062	12.89	584.0967	7.50556	30.89985	0.19	3.72
5	2001	21.74881	22.01675	-0.00168	13.05	596.4991	9.712605	34.28196	0.19	-1.36
5	2002	27.34252	31.92103	-0.02712	13.22	740.1034	10.18007	31.99735	0.2	1.2
5	2003	33.62604	35.40196	-0.01243	13.63	735.7052	14.17551	37.52061	0.19	0.12
5	2004	37.05445	38.21445	-0.00926	14.78	639.2385	15.59173	34.00974	0.15	-0.7
5	2005	25.62491	31.84798	-0.06877	14.9	786.7088	13.14512	30.49222	0.12	0.34
5	2006	13.56096	22.18707	-0.10871	15.41	678.2602	7.240972	20.55672	0.1	-1.34
5	2007	21.09366	25.35626	-0.37144	16.32	755.4237	8.818475	11.1347	0.09	0.48
5	2008	23.13304	31.58649	-0.39425	16.94	845.6317	7.782244	11.45216	0.1	1.46
5	2009	18.06663	27.45954	-17.1493	17.89	779.2153	6.392607	9.735014	0.09	-0.16
5	2010	20.75348	33.31481	-1.1939	19.34	756.541	6.9153	11.50419	0.08	-0.28
5	2011	22.90943	36.87597	-1.60326	20.96	661.0853	6.980212	11.54199	0.12	-0.02
5	2012	25.2977	35.09094	2.50925	22.3	648.9563	7.579907	10.3927	0.08	2.06
5	2013	30.11513	41.95196	-2.33484	23.4	644.9299	7.088407	9.993777	0.03	0.02
5	2014	32.93218	40.31021	3.087597	24.7	664.0429	7.04677	8.581629	0.07	0.48
5	2015	38.82088	38.1301	0.024629	24.63	742.9809	7.812023	8.131991	0.08	0.92
5	2016	39.42924	40.32844	-0.02664	25.43	804.1111	7.818985	8.570934	0.08	1.84
5	2017	40.5969	40.30124	0.036615	25.76	753.3348	9.065126	9.164346	0.1	1.12

APPENDIX B: NORMALISED INDEX PANEL DATA

Country	Year	SGDPE	SGDPI	SGDPT	IDI	ETCP	IRGE	IRGI	MTCI	IRD
1	2000	0.71	0.00	0.72	0.00	0.00	0.62	0.01	0.69	0.39
1	2001	0.09	0.00	0.72	0.10	0.10	0.00	0.01	0.62	0.30
1	2002	0.24	0.00	0.72	0.18	0.26	0.14	0.00	0.92	0.04
1	2003	0.18	0.00	0.72	0.21	0.47	0.10	0.00	1.00	0.63
1	2004	0.01	0.00	0.72	0.43	0.47	0.09	0.00	0.92	0.74
1	2005	0.05	0.00	0.72	0.44	0.50	0.20	0.00	0.85	0.88
1	2006	0.00	0.00	0.72	0.42	0.60	0.11	0.00	0.62	1.00
1	2007	0.02	0.49	0.69	0.47	0.75	0.06	0.86	0.46	0.32
1	2008	0.30	0.60	0.70	0.52	0.84	0.46	0.97	0.38	0.56
1	2009	0.08	0.61	0.00	0.58	0.84	0.08	0.80	0.00	0.44
1	2010	0.19	0.62	0.69	0.67	0.92	0.20	0.81	0.54	0.64
1	2011	0.26	0.68	0.67	0.71	0.97	0.27	0.82	0.54	0.67
1	2012	0.32	0.76	0.85	0.78	1.00	0.34	0.88	0.54	0.46
1	2013	0.96	0.93	0.62	0.86	0.76	0.96	0.97	0.85	0.42
1	2014	0.82	1.00	1.00	0.92	0.20	0.79	1.00	0.85	0.28
1	2015	0.87	0.89	0.70	0.92	0.09	0.79	0.90	0.92	0.27
1	2016	1.00	0.80	0.71	0.99	0.17	1.00	0.88	0.77	0.00
1	2017	0.37	0.70	0.66	1.00	0.14	0.38	0.80	0.62	0.17
2	2000	0.12	0.00	0.65	0.00	0.00	0.13	0.08	1.00	0.00
2	2001	1.00	0.12	0.65	0.08	0.09	1.00	0.14	1.00	0.79
2	2002	0.35	0.91	0.65	0.23	0.03	0.36	0.91	0.77	0.95
2	2003	0.02	0.95	0.65	0.24	0.09	0.00	1.00	0.77	0.38
2	2004	0.14	0.90	0.65	0.31	0.06	0.17	0.77	0.68	0.73
2	2005	0.09	0.52	0.65	0.35	0.00	0.20	0.46	0.09	0.36
2	2006	0.00	0.52	0.65	0.40	0.09	0.08	0.45	0.23	0.54
2	2007	0.11	0.36	0.62	0.45	0.11	0.35	0.09	0.00	1.00
2	2008	0.20	0.30	0.63	0.43	0.11	0.40	0.00	0.59	0.46
2	2009	0.22	0.36	0.00	0.50	0.30	0.44	0.01	0.64	0.16
2	2010	0.22	0.34	0.62	0.61	0.52	0.46	0.02	0.73	0.23
2	2011	0.16	0.52	0.58	0.61	0.68	0.33	0.10	0.86	0.57
2	2012	0.10	0.51	0.81	0.78	0.80	0.22	0.08	0.59	0.26
2	2013	0.14	0.70	0.50	0.87	0.74	0.14	0.06	0.36	0.45
2	2014	0.05	0.72	1.00	0.93	0.68	0.00	0.03	0.55	0.44
2	2015	0.07	0.76	0.62	0.92	0.64	0.00	0.05	0.64	0.66
2	2016	0.33	0.88	0.62	0.92	0.91	0.27	0.10	0.55	0.66
2	2017	0.33	1.00	0.53	1.00	1.00	0.34	0.17	0.59	0.45
3	2000	0.00	0.07	0.76	0.00	0.00	0.00	1.00	0.64	0.77
3	2001	0.09	0.15	0.76	0.04	0.04	0.05	0.86	0.45	1.00
3	2002	0.16	0.20	0.76	0.20	0.31	0.07	0.43	0.82	0.80
3	2003	0.06	0.00	0.76	0.22	0.35	0.06	0.18	0.64	0.44
3	2004	0.15	0.23	0.75	0.20	0.47	0.23	0.46	0.55	0.43
3	2005	0.22	0.16	0.75	0.28	0.53	0.55	0.48	0.73	0.00
3	2006	0.22	0.17	0.75	0.39	0.66	0.71	0.58	1.00	0.14
3	2007	0.12	0.23	0.73	0.50	0.70	0.61	0.11	0.55	0.22
3	2008	0.47	0.32	0.74	0.59	0.74	0.89	0.03	0.45	0.02
3	2009	0.57	0.69	0.00	0.28	0.70	1.00	0.26	0.09	0.81

3	2010	0.10	0.45	0.72	1.00	0.85	0.36	0.10	0.27	0.46
3	2011	0.37	0.57	0.71	0.46	0.84	0.67	0.13	0.09	0.22
3	2012	0.18	0.59	0.88	0.80	0.83	0.39	0.10	0.27	0.41
3	2013	0.73	0.76	0.66	0.88	1.00	0.75	0.00	0.18	0.44
3	2014	0.82	0.98	1.00	0.97	0.96	0.76	0.07	0.00	0.45
3	2015	1.00	1.00	0.74	0.98	0.82	0.94	0.14	0.18	0.30
3	2016	0.75	0.97	0.74	0.95	0.98	0.64	0.10	0.36	0.58
3	2017	0.85	0.77	0.70	0.96	0.98	0.87	0.01	0.18	0.63
4	2000	0.64	0.00	0.26	0.02	0.00	0.89	0.00	0.06	0.00
4	2001	0.85	0.00	0.26	0.02	0.02	0.98	0.00	0.00	0.36
4	2002	1.00	0.00	0.26	0.01	0.16	0.99	0.00	0.00	0.35
4	2003	0.61	0.00	0.26	0.00	0.37	0.78	0.01	0.00	0.45
4	2004	0.41	0.00	0.26	0.03	0.66	0.50	0.00	0.19	0.10
4	2005	0.02	0.21	0.27	0.08	0.43	0.38	0.45	0.31	0.48
4	2006	0.00	0.36	0.27	0.14	0.55	0.94	0.80	0.25	0.29
4	2007	0.19	0.64	0.29	0.17	0.58	0.83	0.73	0.38	0.67
4	2008	0.23	0.68	0.28	0.24	0.66	0.33	0.72	0.50	0.72
4	2009	0.28	0.76	1.00	0.27	0.30	0.74	0.76	0.50	0.66
4	2010	0.25	0.81	0.30	0.30	0.43	1.00	0.89	0.63	0.66
4	2011	0.23	0.68	0.32	0.39	0.54	0.76	0.73	1.00	0.49
4	2012	0.23	0.72	0.14	0.98	0.88	0.86	0.75	0.81	0.46
4	2013	0.39	0.89	0.37	0.83	0.78	0.08	0.76	0.44	0.83
4	2014	0.52	0.87	0.00	0.89	0.44	0.29	0.70	0.38	1.00
4	2015	0.47	0.90	0.28	0.88	0.24	0.10	0.78	0.31	0.91
4	2016	0.40	0.91	0.28	1.00	1.00	0.00	0.81	0.56	0.86
4	2017	0.22	1.00	0.33	0.97	1.00	0.32	1.00	0.50	0.83
5	2000	0.02	0.00	0.85	0.00	0.00	0.12	0.77	0.94	1.00
5	2001	0.30	0.26	0.85	0.01	0.05	0.36	0.89	0.94	0.00
5	2002	0.51	0.63	0.85	0.03	0.60	0.41	0.81	1.00	0.50
5	2003	0.74	0.76	0.85	0.06	0.58	0.85	1.00	0.94	0.29
5	2004	0.87	0.86	0.85	0.15	0.21	1.00	0.88	0.71	0.13
5	2005	0.45	0.63	0.84	0.16	0.77	0.73	0.76	0.53	0.33
5	2006	0.00	0.27	0.84	0.20	0.36	0.09	0.42	0.41	0.00
5	2007	0.28	0.39	0.83	0.27	0.66	0.26	0.10	0.35	0.36
5	2008	0.35	0.62	0.83	0.31	1.00	0.15	0.11	0.41	0.56
5	2009	0.17	0.46	0.00	0.39	0.75	0.00	0.05	0.35	0.24
5	2010	0.27	0.68	0.79	0.50	0.66	0.06	0.11	0.29	0.21
5	2011	0.35	0.81	0.77	0.63	0.29	0.06	0.12	0.53	0.26
5	2012	0.43	0.75	0.97	0.73	0.25	0.13	0.08	0.29	0.67
5	2013	0.61	1.00	0.73	0.82	0.23	0.08	0.06	0.00	0.27
5	2014	0.72	0.94	1.00	0.92	0.31	0.07	0.02	0.24	0.36
5	2015	0.93	0.86	0.85	0.91	0.61	0.15	0.00	0.29	0.45
5	2016	0.96	0.94	0.85	0.97	0.84	0.16	0.01	0.29	0.63
5	2017	1.00	0.94	0.85	1.00	0.65	0.29	0.04	0.41	0.49

APPENDIX C: AN OVERVIEW OF REVIEWED STUDIES

Table C.1: An overview of the reviewed studies

Place of study	Source(s)	Title of research study	Research method	Variables measured	Research findings
Sub-Saharan Africa	Rekiso (2017)	Rethinking regional economic integration in Africa as if industrialisation mattered	Analysing the evolutionary and theoretical framework		There is a positive, circular, and accumulative relationship between industrialisation and REI in South Africa, but the association with the advanced economies has indicated a negative impact
SACU region	Manwa & Wijeweera (2016)	Trade liberalisation and economic growth link. The case of SACU from 1980 to 2011	Autoregressive distributed lag (ARDL) framework. Bound testing integration approach	• labour • average tariffs • trade ratios • GDP per capita capital stock • human capital	South Africa benefited both in the short-run and long-run compared to the other members of the group
Sub-Saharan African countries	Ahmed (2016)	Integration of financial markets, financial sector development and growth. Is South Africa different?	Dynamic panel data analysis. Generalised Method of Moment Estimator	• real GDP • private credit (% of GDP) • government spending (% of GDP) • inflation • trade openness	There is a positive association between the integration of financial markets and financial sector development and a negative relationship between the integration of financial markets and economic growth

Place of study	Source(s)	Title of research study	Research method	Variables measured	Research findings
				• population growth rate • secondary schools' enrolment • investment rate	
South Africa	Ebinoluwa Bimbola Akinrata (2016)	the regional economic integration concept of South African construction industry: lessons for other African industry	Theories / documents / reports review	• employment • globalisation • private sector participation • foreign participation • profit levels • investment • FDI	Mixed results. Some positive effect on other areas and negative on some were noted
countries in Africa	Muhanji & Ojah (2016)	Governance infrastructure and indebtedness of African countries: Do regional blocs matter?	GMM; Factor Analysis Technique	• External debt • Governance variables (political and regulatory factors) • Exports • Imports • Terms of trade	Through regional integration, there are potential external debt management strategies that leverage effective governance structures and enhance economic growth
Europe to MENA regions	Chenaf-Nicet & Rougier (2016)	The effect of macroeconomic instability on FDI: A gravity estimation of the effect of regional integration in the case of Europe Mediterranean agreements	Gravity model	• GDP per capita • distance between countries • economic size of markets • tax on capital flows • FDI inflows	FDI between two countries increases with source GDP instability and with host stability

Place of study	Source(s)	Title of research study	Research method	Variables measured	Research findings
				• capital flow controls	
France	Figueiredo, Lima & Orifice (2016)	Migration and RTAs: a new gravity estimation	Gravity model estimation	• Population size in the destination and original countries • Number of migrants living in a country • Bilateral migration costs • Migration costs to the original countries	Presence of RTAs stimulates the migration stocks amongst member countries
EAC	Nnyanzi; Babyenda & Bale (2016)	Regional economic integration and Tax revenue in the EAC	GMM	• Tax rates • Total revenue from the tax • GRN spending	East African regional integration has had a significant effect on tax revenue, owing to the presence of good institutions
East African countries	Muriuki & Kasimbei (2015)	Impact of regional integration on the economic growth of EAC	Quantitative methods using cross-sectional time series. Panel regression Estimation technique (FE Model & Random-Effects Model)	• terms of trade • FDI • GDP • exchange rate inflation	TOT and FDI had a significant positive correlation with GDP. Whereas exchange rates and inflation had a significant negative correlation with GDP

Place of study	Source(s)	Title of research study	Research method	Variables measured	Research findings
Sub-Saharan Africa, Developing Asia, Latin America & the Caribbean	Santos-Paulino (2015)	Examining the effect of regional Integration on Economic development	Quantitative standard OLS and GMM	• GDP per capita, Education, Inequality • investments, Government expenditure • financial openness • money supply as a percentage of GDP & population growth	RI leads to bilateral trade increases, decreases intra-household inequality, and increase GDP per capita growth. The effect was strong amongst countries in developing Asia
SACU countries	Manwa (2015)	Impact of trade liberalisation on economic growth (SACU countries)	Quantitative time-series approach. ARDL bound testing approach	• tariffs • trade ratios • real effective exchange rate • GDP per capita, Capital stock • labour stock, Human capital stock	There is an insignificant effect of trade liberalisation on economic growth in all other countries except South Africa
USA	Candau & Dienesch (2015)	Spatial distribution of skills and regional trade integration	Gravity model	• domestic trade inflows • international trade inflows • secondary and tertiary education attainment • multilateral trade • high skilled wages • low skilled wages	Highly skilled people chose the core region, and intermediate skill workers move to the periphery. So regional trade integration has been a determinant of the spatial distribution of skills in the USA

Place of study	Source(s)	Title of research study	Research method	Variables measured	Research findings
				• population • GDP	
EAC and EU	De Melo & Regolo Julie (2014)	The African Economic Partnership Agreements with the EU: the case of the EAC	General Equilibrium Model	• the average applied statutory tariff rates • average applied collected tariff • total tariff revenue (TTR) as a% of GDP • TTR as a% of GRN spending • TTR as a% of import revenue • EU import share • revenue and welfare effects	Revenue and welfare effects are rather small
East African Community	Muthonga, Obere, Kimani Mburu & Mukwate-Muchai (2013)	Regional Integration's effect on economic growth in the East African Community	Qualitative and quantitative methods. Generalised Method of Moments	• real GDP per capita growth rate • real exchange rate, Government security rate, • bank rate spread Control variables employed were • FDI • inflation, Government balance as a	Regional Financial integration significantly stimulated the economic growth of EAC

Place of study	Source(s)	Title of research study	Research method	Variables measured	Research findings
				percentage of GDP • corruption perception index	
SACU; UEMOA; COMESA; ECOWAS	Kumar et al (2014)	Does economic integration stimulate capital mobility? Analysis of four RECs in Africa (1960-2009)	Fully modified ordinary least squares; Panel Cointegration Method	• Investment (% of GDP) • Savings (% of GDP)	International capital mobility has only slightly increased in the African economies due to these agreements
EAC and South Africa	Eyster (2014)	Economic Development and regional integration in the EAC and South Africa case study	Documents review	• life expectancy, infant mortality rate, population levels, adult literacy rate, FDI • inflation • GDP growth rates • GDP per capita	There will be a positive effect if corruption and volatile political situation are avoided
Egypt	Eltahir (2013)	Does trade openness promote long-run growth in Egypt?	ARDL Bounds testing approach for cointegration and impulse response analysis for causality	• Real GDP growth • trade openness (exports/ imports or trade) • real capital stock • skilled labour levels	A positive relationship established between trade openness and economic growth
SACU & China	Munemo (2013)	Potential trade, welfare and revenue effects of Preferential Tariff	Partial Equilibrium Analysis	• the flow of imports from China • trade expansion on initial imports	Tariff liberalisation alone is inadequate for successful trade integration, as it benefits mostly South Africa only and harms some

Place of study	Source(s)	Title of research study	Research method	Variables measured	Research findings
		Liberalisation between SACU and China		• trade creation effect • SACU exports to China • export expansion • change in consumer surplus • trade diversion	of SACU's internal and external trade
SACU region	Basdevant, Benicio & Yakhshilikov (2012)	Inequalities and growth in the SACU region	Panel Correlational analysis.	• GDP per capita • Gini coefficients, investment in infrastructure, external shock (changes in TOT) • quality of public institutions	Reducing inequalities can extend the length of the growth spells and offer durable solutions to poverty and long-run growth
EU; NAFTA; Mercosur; AFTA	Geldi (2012)	Trade effects of regional integration: A Panel Cointegration Analysis	Growth model cointegration analysis	• the bilateral real exchange rate between original and destination countries • RGDP • population • distance between the two countries	In the EU, intra-union trade creation effects are approximately six times larger than the other union effects. NAFTA exports to outside countries are significantly diverted. Mercosur-Integration has not contributed to the intra-trade union
Lowly developed countries (Ethiopia, Malawi, Mozambique,	UNDP (2011)	Regional Integration and human development: A pathway for Africa	Quantitative estimates. Elasticity estimation	• education • health • FDI • trade • investment	Regional integration has a positive influence on human development

Place of study	Source(s)	Title of research study	Research method	Variables measured	Research findings
Senegal, Tanzania, and Uganda)				• poverty, Employment environment	

EAC	Erick (2011)	The effect of regional integration on economic growth and development	Inferential correlation analysis	• Capital accumulation • Imports • Exports • Trade flows • Population growth • GNP • GDP • Technological progress	Regional integration has a positive effect on economic growth and development
Southern Africa focusing on SADC & SACU	Chanda (2010)	Regional integration in Southern Africa focusing on the future of SADC & SACU	Desktop study/theories and literature review	• employment, globalisation • private sector participation • foreign participation increased profit • investments • FDI • involvement of investment finance	Integration remains a crucial strategy for Southern Africa to transform from Least-Developed Countries (LDCs) to a robust, united block of developed nations and global force

COMESA, EAC & SADC	Kamau (2010)	The effect of, regional integration on economic growth. Empirical evidence from COMESA, EAC & SADC	Quantitative. GMM estimation technique	• GDP • investment to GDP ratio • population growth rates • gross secondary school enrolment • government consumption to GDP ratio • political instability index • Economic Integration Index (intraregional trade intensity)	There is a positive relationship between economic growth and regional index
East Asia and Japan, Korea, and China	Thomassin & Mukhopadhyay (2010)	The effect of regional integration in East Asia	Global Trade Analysis Project (GTAP) model	• GDP • Exports as a% of GDP • Imports as a% of GDP • Welfare	Regional integration resulted in growth in output and import, and output shares increased
USA & SACU	Brown, Kiyota & Stern (2007)	Analysis of a US-SACU Free Trade Agreement	Michigan Model of World Production and Trade	• Tariff rate • Employment by sector • Trade by sector • The stock of US FDI in SA • Exports and Imports by sector	Benefits of an FTA are rather small. The interest of the global trading community could be served by unilateral arrangements, especially the multilateral liberalisation
countries globally	Baier and' Bergstrand (2007)	Do FTAs increase member states' international trade?	Gravity model	• Nominal bilateral trade flows, nominal GDP, GDP deflators, Bilateral distances	FTAs approximately double two member's bilateral trade after ten years

EAC	Mwasha (2007)	The benefits of regional economic integration for developing countries in Africa: a case study of EAC	Case study-descriptive quantitative data analysis	• Exports from EAC as a% of exports • Imports to EAC as a% of total imports • FDI Inflows • FDI stock	Members' partners benefit through increased trade, expanded markets, FDI attraction, increased bargain, strengthened security and free movement of people
Tanzania	Kweka and Mboya (2004)	Regional integration and poverty: the case of Tanzania	Qualitative and quantitative data (correlation analysis)	• FDI • Trade • Intra and extra-regional investments • Exports as a share of GDP • HDI • The primary school enrolment rate	Regional integration improved intraregional trade but not FDI. Regional integration reduced poverty through increased exports of agricultural products
Europe	European Commission Report (2003)	Impact of economic and social integration on employment in the context of enlargement (market expansion)	Case study: quantitative data analysis	• Labour force migration • FDI • Trade openness • Labour market survey	Economic and social integration affects employment positively, although the magnitude of the overall effect will be small and not evenly distributed
EU & ECOWAS	Venables (2003)	Winners and losers from regional integration agreements	Factor endowment-based model	• Per capita income • Ad Valorem tariffs • GDP • Consumption levels • Production costs relative to the rest of the world	Countries with a more comparative advantage are disadvantaged than those with less

				• Distribution of commodities over the space.	

Source: Developed by author